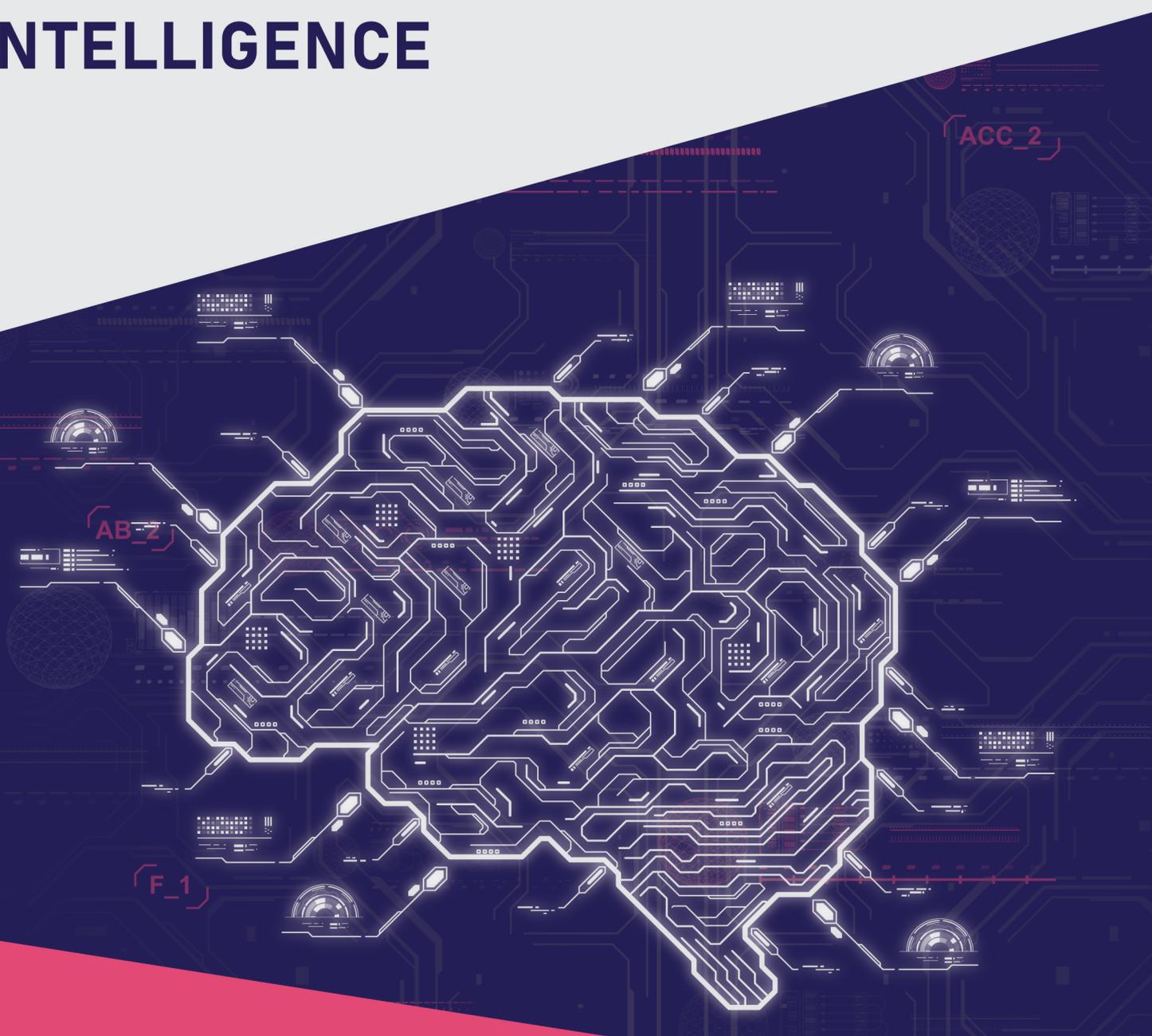


# A THOUGHT LEADERSHIP REPORT SHOWCASING ARTIFICIAL INTELLIGENCE

THE  
MUMBAI  
SUMMIT  
2020

The logo for 'AI' is rendered in a large, bold, dark blue font. The letter 'A' is partially overlaid by a red, three-dimensional geometric shape that resembles a stylized 'I' or a cube, creating a layered effect.

[www.themumbaisummit.com](http://www.themumbaisummit.com)



**Where do we stand? Where are we headed?**

# A THOUGHT LEADERSHIP REPORT SHOWCASING ARTIFICIAL INTELLIGENCE

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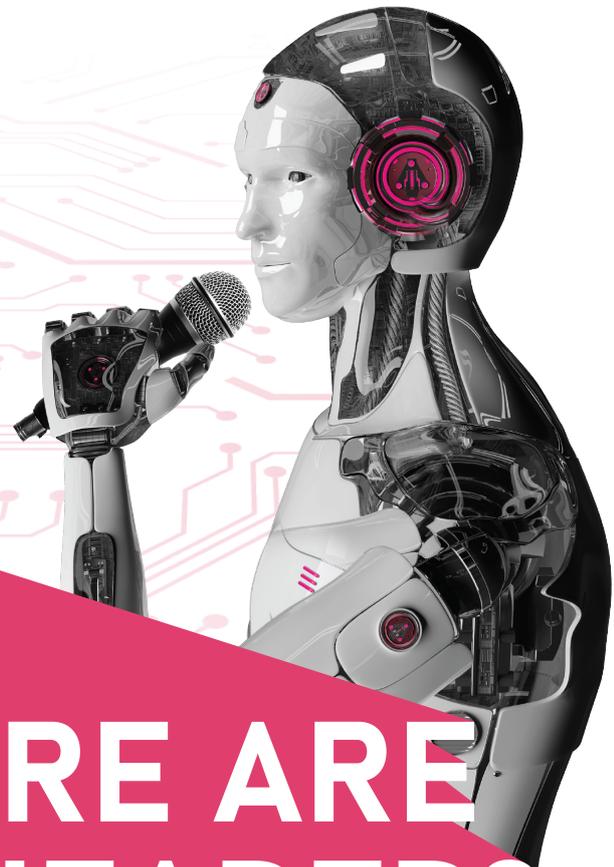
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# Artificial Intelligence



WHERE DO WE STAND?

WHERE ARE WE HEADED?

"As more and more artificial intelligence is entering into the world, more and more emotional intelligence must enter into leadership."

**Amit Ray, Famous AI Scientist,  
Author of Compassionate Artificial Intelligence.**

"Success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks."

**Stephen Hawking, Famous Theoretical Physicist, Cosmologist, and Author.**

"I have always been convinced that the only way to get artificial intelligence to work is to do the computation in a way similar to the human brain. That is the goal I have been pursuing. We are making progress, though we still have lots to learn about how the brain actually works."

**Geoffrey Hinton, Famous AI Scientist.**

"AI doesn't have to be evil to destroy humanity – if AI has a goal and humanity just happens in the way, it will destroy humanity as a matter of course without even thinking about it, no hard feelings."

**Elon Musk, Technology Entrepreneur, and Investor.**

"Much has been written about AI's potential to reflect both the best and the worst of humanity. For example, we have seen AI providing conversation and comfort to the lonely, we have also seen AI engaging in racial discrimination. Yet the biggest harm that AI is likely to do to individuals in the short term is job displacement, as the amount of work we can automate with AI is vastly bigger than before. As leaders, it is incumbent on all of us to make sure we are building a world in which every individual has an opportunity to thrive."

**Andrew Ng, Co-founder and led of Google Brain.**

# FOREWORD

## The Artificial Intelligence (R)Evolution

The wheel is often quoted as the single most important advancement in the early 'history of technology', and today AI is expected to be a critical cog-in-the-wheel, in the world of emerging technology which is transforming the way we live and work. AI is expected to revolutionize our lives by bridging the gap between what humans are capable of and what is actually possible – by penetrating across industries and functions, to take over basic tasks from humans and seamlessly interacting with our daily lives.

According to a study conducted by McKinsey Global Institute, it is predicted that by 2030, 70% of companies, globally, might have adopted at least one type of AI technology at scale.(1)

Quoting from a PwC report – Artificial intelligence is expected to add USD 15.7 Trillion (14%) to the global GDP by 2030 – thereby making it the biggest commercial opportunity in today's fast paced world. (2)

As per UNDP, there are close to 200 cases of AI's actual or potential uses for non-commercial benefit of society, with a considerable potential for computer vision, natural language processing, even deep learning applied to traditional databases, as well as other AI capabilities, to make a very sizable difference to the society at large. (3)

There has been a cloud of fear, as with as with any other evolving technology, that the rise of AI and automation will displace humans from the

workplace. While AI has the potential to replace some process-oriented jobs in areas like book-keeping or recruitment, where companies are now using AI to match candidate profiles with job openings, the fear that AI will become smarter than humans and replace them in the workplace is an exaggeration.

Machines have always had an impact on employment by automating basic tasks. However, while some jobs tend to be lost, significantly higher percentage of new jobs get created – thereby providing newer opportunities for a skilled and evolving talent pool, to perform knowledge-based jobs. With an increasing adoption of AI, it is expected to spur new curriculum and courses, laying the base for an evolving talent pool, that can get absorbed by the changing demands emerging from industries that have adopted AI. We are already seeing full-time programs being rolled out by academic institutions, self-paced and live online programs as well as, course rolled out by industry bodies to meet the requirements of their member base.

The role of humans in relation to AI, is of paramount importance. Just like teams need diversity of ideas, perspectives and different ways of problem-solving, in-order to avoid biases of any nature; for modelling an AI engine, we need a multi-disciplinary team and inputs, that coaches the engine. That's where man-machine interaction comes into play. This will enable "Responsible AI" and "Ethics in AI". AI has not only disrupted the technology but has created value to it.

- **AI holds the potential to address socioeconomic concerns such as stimulating economic growth, improving global health and education and helping enhance the quality of life for humans.**
- **AI systems like chatbots, digital assistants and robots can, at least partially, carry out customer service operations such as informing about new products/services, handling feedback and concerns and responding with solutions.**
- **AI applications hold the potential to automate a number of repetitive tasks such as entering timesheet hours and routine communication such as emails and paperwork.**
- **AI, when integrated into businesses, is expected to bring about higher productivity, efficiency and growth.**
- **AI managers at the workplace can improve fairness and transparency in conducting appraisals and giving promotions and raises at the workplace.**

[1] <https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy>

[2] <https://www.pwc.com/gx/en/issues/data-and-analytics/publications/artificial-intelligence-study.html>

[3] [https://www.undp.org/content/undp/en/home/blog/2019/Using\\_AI\\_to\\_help\\_achieve\\_Sustainable\\_Development\\_Goals.html](https://www.undp.org/content/undp/en/home/blog/2019/Using_AI_to_help_achieve_Sustainable_Development_Goals.html)

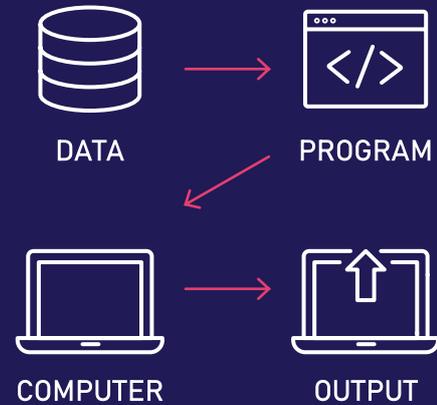
## What has been India's AI growth story?

AI has the possibility to add \$957 billion or 15% of the present gross value – to the Indian economy by 2035. However, “Where Do We Stand. Where Are We Headed?” is the question that we all ask, as stakeholders of the AI ecosystem in India; as, India currently does not feature in the Top-10 countries investing significantly in furthering research and use of artificial intelligence as a technology that will help build the future of enterprises and economies.

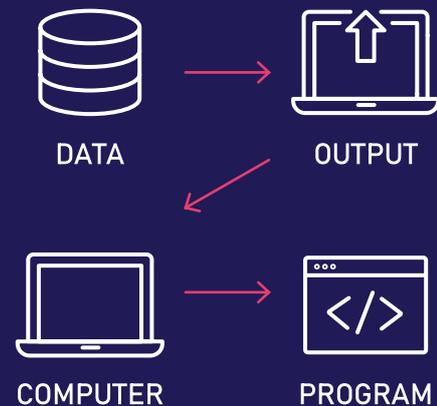
While most of us have been used to “chatbots” as a primary use-case of AI, there's a lot more to it. – as serious business. Perhaps the biggest one of national significance being “Pragyan Rover” – a 6-wheeled AI powered vehicle, aboard the Vikram Lander, as a part of our space exploration mission, Chandrayaan-2. The AI-powered “Pragyan Rover” is also a classic example of collaboration between industry-academia-research; which is a must for building out a robust technology based ecosystem.

Over the next few pages in this report, we have tried to cover a snapshot of the Indian AI Landscape by featuring interviews with industry leaders, an overview of the R&D ecosystem in India driven by Government, Industry and Academia, a detailed EDGE Framework analysis that classifies AI on the basis of market size and industry adoption, followed by a mapping of India AI startups on the EDGE Framework, the Top-50 AI startups in India and the Top-50 AI investments in India on the basis of core technology, industry use case and business function adoption, and finally the Top-20 AI Influencers in India.

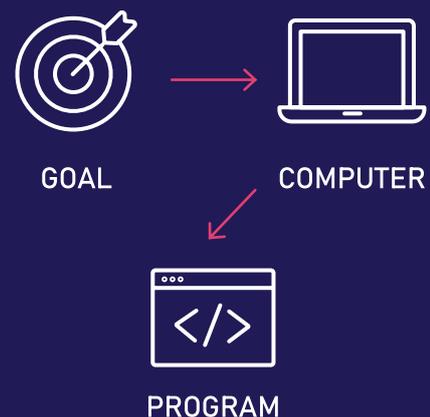
### Traditional Programming



### Machine Learning



### Goal Based AI



## AI Ecosystem in India

## Government Initiatives

### AIRAWAT - NITI Aayog

India, being the fastest growing economy with the second largest population in the world, has a significant stake in the AI revolution. Recognising AI's potential to transform economies and the need for India to strategise its approach, Hon'ble Finance Minister, in his budget speech for 2018 – 2019, mandated NITI Aayog to establish the National Program on AI, with a view to guiding the research and development in new and emerging technologies. In pursuance of the above, NITI Aayog has adopted a three-pronged approach – undertaking exploratory proof-of-concept AI projects in various areas, crafting a national strategy for building a vibrant AI ecosystem in India and collaborating with various experts and stakeholders. Since the start of this year, NITI Aayog has partnered with several leading AI technology players to implement AI projects in critical areas such as agriculture and health.

The Strategy is termed #AIForAll is focused on leveraging AI for inclusive growth in line with the Government policy of Sabka Saath Sabka Vikas. Role of the Government has been clearly delineated to develop the research ecosystem, promote adoption and address skilling challenges. The strategy also flags important issues like ethics, bias and privacy issues relating to AI and envisions Government promoting research in technology to address these concerns. The focus is on sectors like agriculture, health and education where public investment and lead would be necessary.

### Government of Telangana

The government of Telangana has announced 2020 as the Year of AI and plans to make the next decade as Telangana's decade of AI with an aim to establish Hyderabad as amongst the top 25 Global Artificial Intelligence (AI) Innovation Hubs.

The government plans to attract and enable 200 AI innovators/startups leading to a valuation of \$3-4 billion to build their base in Hyderabad along with educate and attract top AI talent to work on critical areas and enable government and key industry verticals to leverage AI and deliver public transformation contributing an additional 1 percent to Telangana's GDP.

The Telangana Government has identified six key pillars to strategise AI creation of datasets and developing a data exchange platform whose aim will be democratise seamless availability of data in the areas of mobility, healthcare, agriculture and e-governance that can be used in innovation, governance and successful business outcomes. The State Government plans to make itself a nationally and globally recognised resource center for data sets and algorithms from and for India, with a mechanism to make these available for research and innovation along with creating India AI Data Trust.

### Government of Maharashtra

Government of Maharashtra has signed a Statement of Intent with NITI Aayog for collaboration in areas of emerging technologies such as Artificial Intelligence, Blockchain and Internet of Things. State level pilots in Maharashtra will be replicated across the country in partnership with NITI Aayog. In February 2018, the Government of Maharashtra launched Wadhvani AI, a not-for-profit Institute with a focus on solving social problems by harnessing the power of Artificial Intelligence. This Institute was inaugurated by the Hon. Prime Minister and is currently working in the areas of Agriculture and Healthcare.

Government of Maharashtra has set up 2060 automatic weather stations in every revenue circle of the State and uses Artificial Intelligence and Machine Learning to generate farm and weather related data, generating valuable insights for the farmers.

In 2019, an International Center for Transformational Artificial in Health (ICTAI - Health) was set up by Government of Maharashtra in partnership with Niti Aayog and Wadhvani AI and support by TATA Trusts, WISH Foundation, Stanford University, IIT - Madras and PATH Foundation. The State has also signed an Memorandum Of Understanding with University of Southern California for collaboration in using Artificial Intelligence for Societal Benefit. In order to continue the focus on technology-based solutions in governance, Government of Maharashtra is looking to partner with startups and organisations that are passionate about solving social challenges using their Artificial Intelligence based solutions.

The second pillar is making the required infrastructure available by setting up super computing infrastructure. The third is the availability of a quality talent pool through various hackathons and certification programmes along with training 30,000 students in AI/ML/DS and Deep Learning in the next three years. The fourth pillar is governance, ethics and privacy.

Fifth pillar is research and innovation wherein the government would like to develop human capacity in advanced AI technologies aimed at solving India specific problems by attracting talented researchers across the world to work at our research centres.

The final pillar is enabling AI adoption and community collaboration wherein the state is already leading the way globally for 'Government-as-a-buyer' for AI which is transforming public service delivery and governance with deep technology.

## AI Ecosystem in India Research Centres

### **Bosch [IIT Madras]** <https://rbcdsai.iitm.ac.in/>

IIT Madras joined hands with Bosch to establish its centre for data science and artificial intelligence in the campus. The technology giant would be investing ₹20 crores over the next five years in the centre to address core challenges in the field.

### **Google AI Research Centre** <https://ai.google/research/>

At the Google AI for India 2019 event, the search giant announced it's opening an AI research center in Bangalore, led by scientist Dr. Manish Gupta, an ACM Fellow and Infosys Foundation Chair Professor at IIT Bangalore. The center, called Google Research India, will focus on tools that can be used by government and private entities. The company wants to work with local talent in the field of machine learning, computer vision, languages, speech, systems, and several other related areas. Along with Gupta, Google has appointed Professor Milind Tambe from Harvard University as a director of AI for social good. The center will focus on fundamental AI research by publishing papers and building a strong community in the country, while another group will work on big problems in fields like healthcare, and education, and also apply their ideas to "make apps and services used by billions of people more helpful."

### **Infosys [IIIT Delhi]** <https://cai.iiitd.ac.in/>

Infosys centre for Artificial Intelligence, Indraprastha institute of Information Technology, Delhi is supported by Infosys Foundation to do cutting edge research in Artificial Intelligence and related areas. centre for AI aims to be the premier centre in India for development of AI. This includes both the fundamental algorithms in AI to further basic research and also the application of AI for solving societal problems specifically in the Indian Context. Based on these guiding principles we have started working on several problems such as :

- Development of cost-effective Autonomous Vehicles to solve the last mile problem in India
- Unmanned Aerial Vehicles for Agriculture and Environmental and Wildlife Monitoring
- Augmented Reality and Virtual Reality based Avatars
- Natural Language Processing
- Machine Learning and Deep Learning with applications to image recognition, Biometrics
- Fault identification and detection in cyber-physical systems

### **Indo-Taiwan Joint Research Centre on AI and ML [IIT Ropar]** <http://www.iitrpr.ac.in/indo-taiwan/>

Indo-Taiwan Joint Research Centre on Artificial Intelligence and Machine learning is a centre for the collaborative research on artificial intelligence and machine learning in the different areas. The Centre was Inaugurated on July 27, 2019 and is being supported by Ministry of Science and Technology, Taiwan with the joint collaboration of National Chung Cheng University, Taiwan and Indian Institute of Technology Ropar. The research centre focuses on academia to academia and academia to industrial collaborations within in the India and between the India and Taiwan in various domains of AI and ML. The Centre provides exposure to young researchers and emphasis to promote the innovative ideas and research in the field of Artificial Intelligence and Machine Learning in various fields. It provides a deep link between the industry and academia of India and Taiwan.

### **PwC India**

PwC India is setting up its first IoT Lab and the Artificial Intelligence Centre of Excellence in Kolkata and plans to hire 1,200 people from engineering and data analytics background in the next year. It will be the first of their kind for PwC in India.

### **Microsoft Research India**

Microsoft Research India announced the launch of the centre for Societal impact through Cloud and Artificial Intelligence (SCAI). Part of the Microsoft Research (MSR) Lab in Bengaluru, this centre will focus on creating and nurturing projects that can have real-world and large-scale societal impact.

## AI Ecosystem in India

### Ecosystem Enablers - CoE's, Incubators, Accelerators

#### NASSCOM

The NASSCOM Centre of Excellence for Data Science & Artificial Intelligence is an initiative of the Government of Karnataka, Industry & NASSCOM, established on a PPP (Public Private Partnership) model, to catalyze innovation & accelerate the DS & AI ecosystem with Innovators, User Enterprises, & Academia. CoE-DS & AI is established as a physical and virtual centre in Bengaluru with technology partners like IBM, Intel, NVIDIA, Microsoft and Digital Ocean. It provides a multi-technology platform for cloud computing capabilities, APIs and public data for catapulting innovation, industry-oriented research, proliferating data-driven decisions in addition to building talent and upskilling requirements in the areas of Data Science and Artificial Intelligence.

#### Netapp

Netapp's Data Visionary Centre announced the AI Centre of Excellence jointly with NVIDIA, who is a superpower in AI computing world. This CoE will aim to provide an environment for AI enthusiasts to showcase technologies and help customers and partners navigate the world of AI. The idea is to enable them to drive businesses of today and enterprises of tomorrow.

As a part of the partnership, CoE will have notable investment by NetApp in the NVIDIA DGX workstation to provide customers and partners a better understanding of the role of AI and to deploy it to their advantage in a competitive environment. It will also enable them to experience first-hand the solutions and work with the skilled engineers from both NetApp and NVIDIA.

#### NVIDIA

NVIDIA has partnered with the Government of Telangana to setup a High Performance AI Computing (HPAIC) Centre. This centre will also assist in startup incubation, and host AI training sessions to support women and minority groups.

#### Facebook & T-Hub

Facebook and T-Hub announce their India Innovation Accelerator Program focussing on AI as a technology. The program supports the growth of startups focused on finding solutions for social challenges using Artificial Intelligence (AI) in areas of health, agriculture, clean water, sanitation, among others, as AI is the key to finding disruptive solutions to address societal challenges like access, affordability, and skill shortage.

#### Rolls Royce

Rolls Royce said that it will be mentoring and providing technical support to Indian startup specialised in the field of advanced analytics, artificial intelligence, the blockchain, sensing through its acceleration hub, R2 Data Labs. It had also launched R2 Data Labs in 2017 to accelerate data innovation.

## AI Ecosystem in India

### Ecosystem Initiatives

#### Wadhvani AI <https://www.wadhwaniai.org/>

The Wadhvani Institute for Artificial Intelligence is an independent, nonprofit research institute and global hub, developing AI solutions for social good. Our mission is to develop and apply AI-based innovations and solutions to a broad range of societal domains including healthcare, agriculture, education, infrastructure, and financial inclusion. Ultimately our aim is to work with governments, social sector organisations, other innovators, and all other relevant stakeholders to transform the lives of the billions of poor, underserved people in India and the rest of the world.

## EDGE Framework

## Not all AI is Disruptive

Through this report we are taking a unique approach to demystifying AI on the basis of market size and industry adoption. We are calling this the EDGE Framework.

### Industry Size is classified on the basis of :

- Momentum of startups in the space
- Media attention
- Customer adoption - partnerships, customer, licensing deals

### Market Strength is determined by:

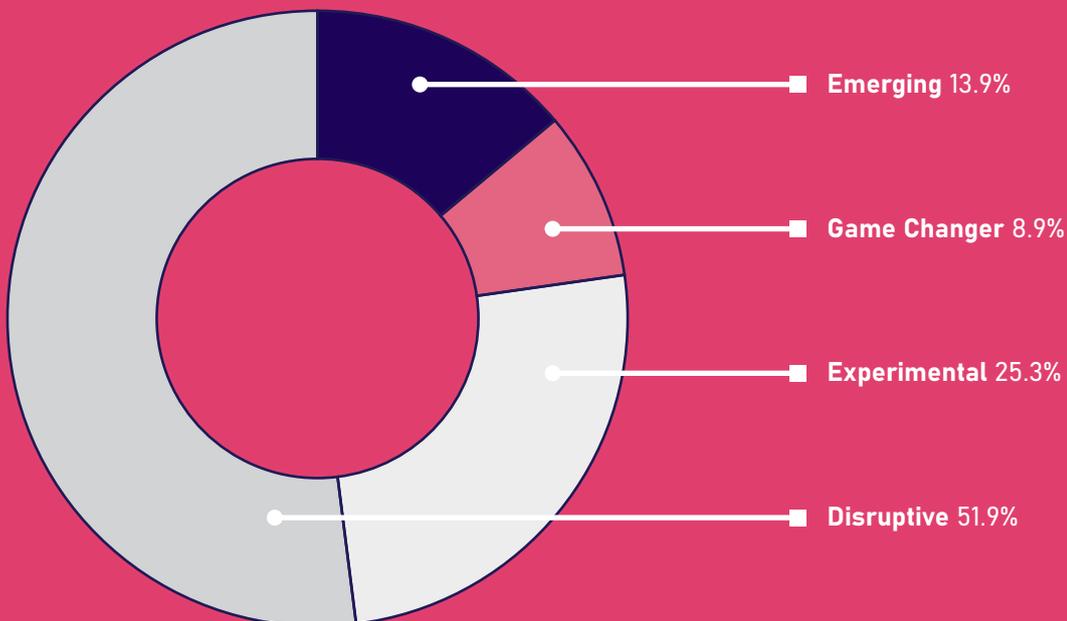
- Market Sizing Forecasts
- Earnings transcript Commentary
- Quality and number of investors and capital
- Competitive intensity
- Investments in R&D
- Incumbent deal making (M&A, strategic investments)

**E** EXPERIMENTAL

**D** DISRUPTIVE  
[Necessary]

**G** GAME  
CHANGER  
[Threatening]

**E** EMERGING  
[Transitory]



## According to EDGE

### EXPERIMENTAL

- BACK OFFICE AUTOMATION
- LANGUAGE TRANSLATION
- AUTO CLAIMS PROCESSING
- ADVANCED HEALTHCARE BIOMETRICS
- CHECK-OUT FREE RETAIL
- CLINICAL TRIAL TREATMENT
- NEXT-GEN PROSTHETICS
- CAPSULE NETWORKS:  
OBJECT / IMAGE RECOGNITION
- ANTI-COUNTERFEIT

### DISRUPTIVE

- OPEN SOURCE FRAMEWORKS
- FACIAL RECOGNITION
- PREDICTIVE MAINTENANCE
- E-COMMERCE SEARCH
- MEDICAL DIAGNOSTICS AND IMAGING
- EDGE COMPUTING

- CROP MONITORING
- REINFORCEMENT LEARNING
- AUTONOMOUS NAVIGATION
- NETWORK OPTIMIZATION

- CONVERSATIONAL AGENTS
- CYBER THREAT HUNTING
- DRUG DISCOVERY

### GAME CHANGER

### EMERGING

#### Experimental

Conceptual or early-stage trends with few functional products which have not seen widespread adoption.

#### Game Changer

Large addressable market forecasts and notable investment activity.

#### Disruptive

Trends which are seeing widespread industry and customer implementation/adoption and where market and applications are understood.

#### Emerging

Trends seeing adoption but where there is uncertainty about market opportunity.

# EDGE Framework Breakup

Experimental : 20

Game Changer : 7

## EXPERIMENTAL

Mihup

Attentive AI

Advenio

PaisaDukan

DeHaat

Mad Street Den

DheeYantra

SigTuple

Onward Assist

Gnani.ai

Niramai.ai

Niramai

RenewBuy

Qure.ai

OS Labs [Indus OS]

Niki.ai

Uniphore

CamCom Technologies

Zvesta

Tricog Health Services Pvt. Ltd

Unbox Robotics

SwitchOn

Flutura

Loginext

Icertis

CynLr

DeTect Technologies

## GAME CHANGER

## Disruptive : 41

## Emerging : 11

### DISRUPTIVE

- SalesKen
- mFine
- Ambee
- FlixStock
- KarmaLife [AI Foundry]
- Artivatic
- Aquaconnect
- Comsense
- HyperVerge
- Grey Routs AI Inc.
- Locale.ai
- Samya.ai
- Shipsy
- Keito AI
- Marsview.ai Pvt. Ltd.
- Vphrase
- Doxper
- Active.ai
- ten3T
- Findability Sciences Pvt. Ltd.
- WYSA
- Fluid.ai
- Intello Labs
- FireFlies AS
- NLP Bots [Light Info System]
- Signzy
- CropIn
- Locus.sh
- DailyHunt
- Pentation Analytics
- Quadrical.ai
- Observe.ai
- Haptik
- Simbo.ai
- Senseforth
- Bankbuddy.ai
- CreditMate
- Arya.ai
- Frontdeskai

- Shortlist Professionals
- Veda Labs
- Orbo.ai
- Dimension NXG
- WhiteHat Junior
- Flickstree
- Meylin Foundry
- Leverage Edu
- Eightfold
- Embibe
- Silvan Innovation Labs

### EMERGING

## AI Penetration in Various Industries

Even as we see economic potential in the use of AI techniques, one has to recognize the tangible obstacles and limitations to implementing AI. Obtaining data sets that are sufficiently large and comprehensive enough to feed the voracious appetite that deep learning has for training data is a major challenge. In some regulated sectors, such as healthcare and financial services, companies must also find ways to make the results explainable to regulators in human terms – as to why did the machine come up with this answer? However, the good news is that AI, as a technology, is advancing and starting to address some of these limitations.

In the following pages, you will see our EDGE Framework that classifies different AI technologies that are currently out there, in terms of (i) market size, and (ii) industry adoption. To give a perspective closer-to-home we have identified an India AI Top-100 on the basis of scouting and investments raised, and plotted them on the “X Axis” and “Y Axis”, to give a visual illustration of AI adoption in enterprise across India, with some familiar names that you will be able to associate with.



### Healthcare

**AI is changing the way we think about mind and body, life and death and what we value most “human experience”. Just the Beginning Indeed, Imagine the Possibilities.**

The Imaginable Future of AI and healthcare is that there is no healthcare anymore, because nobody needs it. You could actually have AI that is directly talking to your immune system, and is actually preemptively creating the antibodies for the epidemics that are coming your way and will not be stopped. This will not happen tomorrow but it's the long term goal that we can point towards.

The growth of artificial intelligence in the healthcare market is mainly driven by fast-rising demand for precision medicine, predictive diagnostics. Apart from providing better healthcare services, AI can also help with effective cost reduction in healthcare expenditure. Healthcare personalization is crucial due to its use in medical diagnostics, where a patient's present and historical data is used to detect and predict serious health conditions. In addition, the growing need for accurate and early diagnosis of chronic diseases and disorders further supports the growth of this market.

#### The Capabilities of AI

Including automating routine tasks, analyzing big data, and bringing intelligence and learning to various processes, expands our capacity to understand and solve complex, dynamic and interconnected global challenges such as the UN SDG's. In recent times, with COVID-19 hitting us hard and global pandemic causing citizens to be panic stricken – Governments adopted AI technology to address citizen concerns and reduce anxiety and stress on the healthcare systems. Jio Haptik joined hands with WhatsApp and MyGov and have built a chatbot that's really well adopted by citizens who want their queries addressed. In the first 20 days of its release, the AI powered chatbot attended to 22 Mn unique users, and addressed 31 Mn queries with an 80% automation.

**For a Retinopathy project over 1,00,000 eye scans were graded by eye doctors who rated each eye scan on a scale from one to five, from healthy to diseased.**

- AI can step in and be that early detection system.
- AI makes intelligence cheap.
- AI impact may not be the impact that catches the most headlines, but in many ways it'll be the most important impact.
- AI is now the next generation of tools that can be applied to meaningful problems.

**Take Cancer as an example of how AI can help save lives. We would take a sample of somebody's blood and look for the minuscule amounts of Cancer DNA or tumour DNA in that blood. This is a great application for Machine Learning.**

# 20-22-31-80

**No, that's not a toll free number or a helpline.**

**Those are figures of AI and GovTech to the rescue of citizens during COVID-19.**





## Media & Entertainment

Artificial Intelligence has found its way in the audiovisual industry in the last few years, gaining special importance in the Broadcast & Media industries. The number of solutions including AI systems for the development of editing and media management tasks has increased exponentially, especially the solutions focused on the most repetitive tasks and, therefore, those most likely to be automated.

The main areas of application of AI are cataloging and metadata detection, automated thanks to these tools. The amount of time needed for content cataloging is reduced to almost "real-time" thanks to AI, which applied to day-to-day work at a regular TV station can create powerful analysis tools that can even be used for news and live production. However, the benefits of AI are not exclusive to the generation of information directly from the media.

Whether one is watching the latest series on Amazon Prime, Netflix, or YouTube, AI is making the decisions for you. AI is playing a huge role in recommending a video on YouTube or a show on Netflix and pre-creating a playlist on Spotify, or any music streaming service. Also, using past viewing data, bandwidth usage is predicted to help decide when to cache regional servers for faster load times during peak demand for improved streaming quality. YouTube's automatic captioning uses AI to subtitle the videos. It captures the voice and converts it to text.



**Sreeraman Thiagarajan,**  
Co-Founder & CEO, Aawaaz.com

“ HUMANS BUILT LEVER, WHEEL, COMPUTER.  
AI IS NEXT - MORE WORK IN LESS EFFORT.

Voice is the input, AI helps in transforming the audio into various vernacular languages. The product needs to be trained particularly, no need of a lot of data, need to the extent of the Product.

The video game industry is one of the earliest adopters of AI. Any game that you play has some sort of application of AI. When you are playing games such as PUBG or Fortnite, you start off against a couple of AI-powered bots before moving on to play against real players. When you are playing racing games, you are racing against AI bots.

Companies like Agrahyah Technologies, Myelin Foundry, Orbo AI featured later in the report, under the AI-50, Top AI Investments and EDGE Framework outline how some of our Indian AI startups are leveraging the power of AI to transform media and entertainment.

LinkedIn uses AI to help match candidates to jobs creating better employee-employer matches. Employers can find the potential candidates by screening their resumes and deciding the best fitment to a role. We have a few startups classified under AI and the Future of Work and AI use cases for HR, listed down in the report.

**The accuracy, speed and amount of information generated with AI tools open the door to many other applications in other industry areas.**

■ **Marketing and Advertising:**

Companies are training machine learning algorithms to help develop film trailers and design advertisements.

■ **Personalization of User Experience:**

Entertainment providers are using machine learning to recommend personalized content based on data from user activity and behavior.

■ **Search Optimization:**

Media content producers are using AI to improve the speed and efficiency of the media production process and the ability to organize visual assets.





## Large Enterprises

As with other machine learning techniques, deep learning is an important building block for artificial intelligence in the enterprise. Deep learning is a kind of machine learning that handles much more complex relationships between inputs and outputs. Deep learning is often used with unstructured data in applications for image recognition, speech recognition and natural language processing.

Here are a few examples with more enterprise context:

- A shipping company could train a model to recognize whether images of boxes on a conveyor belt for loading trucks have been damaged by using lots of images of both undamaged and damaged boxes.
- A store could train a model to recognize the product a consumer has placed on a flat surface in order to determine what the buyer wishes to buy—say fresh produce, and of what type—and, thus, how much to charge, i.e. a scanner for everything, including things without bar codes.
- A manufacturing company could train a model to recognize whether parts of the machinery—gears, belts and so on—are broken, damaged or out of alignment.

“ THE BIGGEST CONCERN WHICH PEOPLE ARE ALSO LOOKING INTO IS WILL AI LEAD TO DISPLACEMENT OF WORKERS.

Over 1/3rd of the organisations in India have started the AI journey. To survive in this dynamic Industry one needs to absorb and deploy the technology in the entire functioning of business rather than testing one use case and piloting only in specific functions. Retail, Manufacturing and BFSI Industry are the leaders in India who have adopted AI technology.

AI is a powerful and dual use technology, it depends on how and who uses it. It has both benefits and possible disadvantages. Facial Recognition which is integrated into China's rapidly increasing network surveillance camera, now they look exclusively for minorities based on their appearance and keep records of their coming or going for search and review. China is the only country in the world rolling out the Social Credit system that tracks the activities of the citizens who rank them with scores that can determine whether they can be barred from accessing from flights to online dating services, or even putting their children to school.

Alarming technology deep refers to manipulated videos or other digital representations that are produced by AI, images and sound that appear to be real are actually not real. Those areas are of concern. From a function point

### Key growth enablers for enterprise AI in India :

- Availability of usable structured data across various domains.
- Availability of tech expertise in the talent market.
- Market demand for cheaper options of automation.
- Mobile and IoT availability of the high-end technology.
- A growing number of sector-specific use cases across India, APAC & North America.
- New business models and AI-based solution will drive synergies.



Avnish Sabharwal, Managing Director  
Open Innovation, Accenture Ventures

of view there are many issues in AI related to -Cyber security, Personal Privacy, Explainability. For eg.: a lot of people think that AI is a Black box. In an autonomous car if AI is making a decision, that results in killing a pedestrian, people want to know how an AI makes a decision. National security, political security, Organisation's reputation are still concerns which people are still grappling with.





**Vinayak Hegde,**  
CTO-in-Residence, Microsoft for Startups

“Things which were not possible before because of normal technology are now possible because of AI. Computation power has become easier and algorithms have become more mature - smartphones are so powerful, have more computation power and storage capacity than desktops had 10 years ago. Because of Cloud and network which has become more reliable and cheap it is easy to split - for example, AI models can run with cloud and inputs can be given via the phone.

Better Algorithms and training the algorithms to solve bigger real life problems is something that we should collectively aim to achieve. For that we need to figure out what is the data that is curated. The better data, better algorithm, better computation and structure on which you have to be innovative.

“ SINGULARITY WOULD BE THE MOST SCARY FORESEEABLE PROBLEM IN THE AI WORLD.

#### What draws you towards AI?

I generally tend to think of artificial intelligence as almost a humanities discipline. It's really an attempt to understand human intelligence and human cognition using technology. As we scale every new level of artificial general intelligence, we are one step closer in the process of self discovery - not just of ourselves but about all our selves - the synthesis of all our thinking and reasoning into one AI - pretty frightening at some levels.

#### What scares you most about the AI revolution?

Singularity would be the most scary foreseeable problem in the AI world - when human technology and human intelligence merge as per Ray Kurzweil and other before him (John von Neumann) and recently with Bill Gates and Elon Musk. I think everyone sees the immense potential of AI but some worry about its evolution, end use and the ethics around it all - bias, rights, the whole lot.

“ IT'S NOT ABOUT TECHNOLOGY, IT'S ABOUT HOW YOU IMPLEMENT IT.

Quantum Computing is slowly starting to be more and more viable and there are various experiments running on it and are solving the problems which couldn't be solved earlier for example security keys which were hard earlier have become possible because of quantum computing. There are still many challenges but it's one promising technology that should take off in the next 5-10 years. Microsoft has also been doing a bunch of work in this space.”



**Samiran Ghosh, Senior Advisor,**  
Ex- McKinsey & Co.

#### How important is AI to an entrepreneur or a startup in the enterprise ecosystem today?

AI is more a feature now than a specific and discrete piece of technology. You are not an AI startup; you are really a startup that leverages AI to solve a business problem in a particular industry or functional area. Just like security, you need to build it into the product architecture or built out.

#### What is the most recent development you've heard of, that had an impact on technology in the enterprise ecosystem?

According to a survey of more than 2,500 executives conducted for a new report by Sloan Management Review and BCG - 7 out of 10 companies report little or no gains so far from their AI initiatives. Reason - too many POCs and sporadic implementations. However, in the same survey, 9 out of 10 respondents agreed that AI represents a business opportunity for their company. And nearly half - 45% - perceive some risk from AI. And there are lots of such studies. A McKinsey study concluded that digital mature companies derive more value from their AI investments.



## Banking & Finance

Artificial Intelligence will naturally alter banking, insurance and other financial services over the next few years, impacting customer service, fraud mitigation, loans and credit scores, investment advisories. These all will use AI and Machine learning to deliver an excellent customer experience and efficient operations for banks, insurance companies and the financial sector of the companies.

The major objectives of implementing AI are personalised customer experience, having error-free back-end processes which run without human intervention and faster turn-around-time. Security and compliance appeared to be the last priority. The e-commerce and social media apps have already set the bar incredibly high so users are coming with very high levels of expectation in terms of usability from banking and insurance apps. That brings us to the impact; AI will have to be on the job to meet customer expectations.

The traditional approach will not be able to deal effectively with volume, velocity and variety of data being generated. Data has to be collected from different sources and which is in disparate formats.

The new approach to BFSI is that decision making often goes beyond the traditional consideration of speed, functionality, ROI etc. In insurance, underwriting or personal financial advice, there is a sizable element of subjectivity. Implementing Robotic Process Automation and Artificial Intelligence will result in job cuts but it is temporary. The new opportunities will get created which requires highly skilled resources. The repetitive and routine task will be performed by automation and people can focus on more critical and skillful tasks.

### High level business objectives of automation with Artificial Intelligence in Banking, Insurance and other Financial Services

The primary business objective using AI is to offer a more proactive customer experience by automating back-end processes to reduce human error and improve the TAT (turnaround time) for manual processes. A robot can work 24/7 without human intervention which results in improved SLA and customer satisfaction. The third most important business objective is to monitor all processes and data for regulatory compliance and security. The top fourth business objective with AI is to use it for marketing wherein they'd like to track consumer behaviour so that customized products can be offered to them.

Though in its nascency, the Indian banking sector is beginning to adopt artificial intelligence (AI), quite aggressively. More than 36 percent of large financial institutions are already investing in these technologies, and almost 70 percent report that they are planning to in the near future.

From a customer chatbot perspective, SBI has launched SIA, an AI-powered chat assistant that addresses customer enquiries instantly and helps them with everyday banking tasks just like a bank representative

SIA was developed by Payjo, a startup based in Silicon Valley and Bengaluru. According to Payjo, since its launch, the chatbot has responded to millions of queries from thousands of customers. "SIA is setup to handle nearly 10,000 enquiries per second or 864 million in a day. That is nearly 25% of the queries processed by Google every day,"

HDFC Bank has developed an AI-based chatbot, "Eva", built by Bengaluru-based Senseforth AI Research.

ICICI Bank, India's second-largest private sector bank has deployed software robotics in over 200 business processes across various functions of the company.

Axis Bank launched an AI & NLP (Natural Language Processing) enabled app, Conversational Banking, to help consumers with financial and non-financial transactions, answer FAQs and get in touch with the bank for loan other products.

Chatbots seems to be the primary AI use-case at Indian banks today, with all four banks investing in conversational apps - mostly focused on customer service. In some cases, like in SBI, we have also seen the use of AI-powered smart cameras that captures facial expressions of customers to offer real-time feedback on their experiences.



### Different flavours of AI in BFSI

- Chatbots
- Robo-advisors for Financial Products
- Personalised Financial Services
- Smart wallets
- Emotion AI
- Fraud detection and prevention
- Compliance Monitoring
- Intelligence QRC
- Robotic process Automation
- Insurance Underwriting
- Algorithmic Trading
- Investment Research
- Human Resources



**Sanjaya Shrestha,**  
**Director - Innovation, Barclays**

“ IT IS NOT A QUESTION OF IF ONE WANTS TO ADOPT AI , BUT IT IS A QUESTION OF HOW AND WHERE YOU WANT TO ADOPT AI.

AI is very important for the banking sector, and it cuts across a range of services where we can apply the technology - right from the very basic automation to more cognitive intelligence is there. We see very interesting use cases specially in new customer acquisition, improving customer experience that in the more cognitive elements of AI but those stages its very much limited to more of initial experimentation, pilots or POC's but we do see there are alot of interest in this space and hopefully over a period of time the maturity will also improve. So interestingly in the medical industry AI is helping to make services available to a much much wider consumer base than it is currently available. AI is much more sophisticated software.

Every industry will be impacted but the industry with less regulations will have more scope. The traditional banking customers are going to become a completely different entity all together sometime, they really don't want to even understand whom they are banking with, so what elements of AI that will be interesting is what solution will make banking seamless from a customer experience point of view. It is not a question of if one wants to adopt AI , but it is a question of How and Where

you want to adopt AI. It is very well understood that we want AI to be there to replicate a lot of manual work that's been happening. When we talk about AI, the right term to use now is augmented intelligence. Areas where it can actually augment whatever is currently getting done is what is going to become important. AI is a steady progress which will improve things but imperfection will never fade. Imperfect means there is scope for improvement. We have all learned from history that traditional organizations are not surviving because they have been resistant to change.



**Nimesh Mehta,  
Founder & CEO, Rockmetric Technologies**

“ THE ADOPTION OF AI WILL INCREASE AND THE TECHNOLOGY WILL BECOME SMARTER OVER TIME.

AI is largely making systems and data work and getting them close to how humans would perform the same work at scale. It is the evolution of Technology where it handles more complexity than a traditional technology would do. In my opinion, AI should be strategic and adopted completely from end to end in the system rather than implementing in one part of the chain. example- HRM to Finance to Technology. The adoption of AI will increase and the technology will become smarter over time.

“ CHANGE IS THE ONLY CONSTANT THING, AND IF YOU DON'T CHANGE NOW, YOUR COMPETITORS WILL CHANGE YOU.

We are at an age where Architects design loosely coupled systems based on today's requirements and tomorrow's opportunities. The one who keeps on acquiring new skills and keeps on designing loosely- coupled, false tolerant systems will emerge as a winner. On the same lines, businesses who are still waiting for AI to mature and follow the traditional “fast follower” route (which may have worked in earlier days) will be the biggest losers. These organizations will not be able to catch up to their competitors who are moving at buzzing speed in implementing AI to numerous fragments of their businesses.

AI is a central principle for the disruptive changes in the 4th Industrial Revolution. AI seems to be a constellation of technologies that enable smart machines to extend human capabilities by sensing, comprehending, acting and learning— thereby allowing people to accomplish significantly more.

Companies will apply AI technologies to transform business fundamentally reinventing how they run, compete and thrive. While organizations are embarking on the AI journey, keeping their data/systems secure is the most challenging aspect of any CEO.



**Baxish Mission, Business Head Data Analytics  
and Insights, Blazeclan Technologies**

With the cloud taking centre stage, enterprises are redefining themselves to drive innovation and accelerate their value to the business. On the same lines, security breaches on the cloud are not unusual, and it not only impacts the company's revenue (fines, monetary penalties), it has an irreversible impact on the Brand reputation.

Any organization embarking digital transformation has security as a first challenge, and that's the reason why CyberSecurity is something which we feel will be a game-changer in today's rapid businesses and adopting a comprehensive security strategy will be the key to success for the enterprises adopting Cloud and AI.



## Retail & Consumer Internet

For retail companies, AI creates an opportunity to BRIDGE the gap between virtual and physical sales channels. From daily task management to gaining customer insights, AI is a key technology in a retail setting. The AI market in the global retail market size is expected to exceed \$8bn by 2024, according to Global Market Insights. Factors like demand for supply chain optimization, enhanced business decision making, and forecasting among retailers are proliferating the use of AI in the retail market. Retail organizations emphasize the interaction between the business and customers is critical for the success of the business to create customer loyalty. As most retail businesses today are omnichannel, the use of AI helps them optimize their processes across different platforms, be it web, app, or the physical store.



## Logistics

Logistics sector is one of the most growing sectors, alone contributing around 15% -20% in the Indian economy . It has always been expeditious in the adoption of technology. eCommerce logistics or shipping is such an industry where AI has started showing its influence by making supply chain management a more

**AI play a significant role to save time, reduce costs and increase productivity and accuracy with cognitive automation:**

- **Making the Warehouses more Advanced:**  
Many different eCommerce companies have already started utilizing the robots to automate the process of product sorting and packaging. Robots are programmed to pack a product and sort it based on the delivery requirements.
- **Voice Assistants to the rescue:**  
Artificial Intelligence can also be seen taking shape in logistics through voice assistants. Amazon's Alexa is one such example, which can help customers track their orders placed with the logistics partner DHL. You can ask Alexa about your package and it will tell you where it is. Alexa can even route calls to the customer support of the courier, in case the customer is facing issues with their package.
- **Finding Quickest Delivery Route:**  
Necessity is the mother of invention. In the case of the logistics sector, this necessity is the Travelling Salesman Problem (TSP), which is used to understand the shortest possible route needed by a salesman to the given list of locations. In simple terms, what will be the time taken to deliver the package most efficiently?
- **Assisting in Last Mile Delivery:**  
The last mile delivery in this age of eCommerce is all about creating a personalized experience for the customer. After the order is placed, the executive will be assigned to look after it and process it, and then they need to provide an ETA for the delivery based on dynamic data. To manage all this data becomes a very tedious task.



## Investments in AI

Over the past two years, the growth in the AI startups space has been staggering. A recent report has estimated that over the past 12-months, around \$870 Million was alone raised in the AI space in India's startup capital, Bengaluru. Owing to the spectacular growth in the AI sector, India has emerged as a nation with a robust ecosystem that enables AI startup professionals and founders to kick-start their ventures. As per a McKinsey Global study, it is estimated that AI alone as a technology will be contributing \$15.7 Trillion to Global GDP by 2030 - thereby making it the single largest business opportunity in today's commercial world. Business aside, AI is expected to play an increasingly important role in achieving several of the UN SDG's towards the Vision 2030 goals.

## Venture Funds

### Pi Ventures

Pi Ventures is an early stage venture fund based out of India. The fund focusses on backing product & technology companies in the areas of Artificial Intelligence, Machine Intelligence & IoT , as we rapidly see hardware and software products coming together using artificial and machine intelligence to create disruptive ventures across multiple sectors.

### SenseAI

SenseAI is an Artificial Intelligence venture fund that helps AI founders turn their ideas and technology into successful businesses. Founded by tech entrepreneurs with global expertise and work side-by-side with founders from the initial stages to co-create their venture and provide support in funding, product development and go-to-market.

## Featured Interview



**Manish Singhal,**  
Managing Partner, Pi Ventures

### As an investor, what do you look for in any startup or entrepreneur leveraging AI as a technology?

AI is only a means to solve a problem. As an investor, our first goal is always to evaluate the problem that the entrepreneur is solving and the value proposition of the solution. Having ascertained that, we evaluate whether AI is key to solving this problem. With that established, we look for the following:

- AI expertise within the founding team.
- Use case classification: AI first or AI second? We define AI first as a problem that cannot be solved without AI and AI second as a problem that can be solved without AI but the solution becomes 10x better with AI
- What are the data sets being used? How accessible and unique are they? How much data will be needed to get to >90% accuracy?
- Models being used and why? For feature based models, what are the features and why?
- Roadmap to improve accuracy.
- An understanding of how the combination of data and models can give the startup a moat today and in future.

### How do you see AI adoption in the next 10 years?

Over the next 10 years, AI will become a norm. It will become a standard underlying technology that companies will leverage to do things better across all major sectors. Humans and AI will work together for the win. Also, we'll make considerable progress towards general AI.

### What impact will AI have on Indian businesses and consumers?

Although AI has a global impact, some of the India specific challenges it can solve are:

- **Supply-Demand Gap:**  
India faces a huge supply demand gap, be it skilled vs unskilled labor or doctor vs patient. For example, India has 1 doctor per 1,457 people, lower than the WHO recommended norm of 1:1000. This ratio is far lower in non Tier 1 cities and rural areas, resulting in a lack of quality care for the majority living in these areas. This gap can be bridged by AI in healthcare which today spans across screening, diagnostics and treatment and is particularly significant in the context of public screening, when diseases can be detected early, improving patient outcomes.
- **Bring in Efficiencies:**  
Industries from traditional ones like manufacturing to modern ones like IT are today manually driven leading to lower productivity and quality. AI can augment humans and bring in speed and efficiency that wouldn't be possible for humans.

### According to you, what is the best technological advancement in the domain of AI till date?

There are many technological advancements that have contributed significantly to AI. Some of the key ones are:

- **Deep Learning:**  
Deep learning based on layer wise training of neural networks has made it possible for algorithms to recognise patterns and self learn. It is easier for developers to adopt and is more scalable, getting more accurate with data. Deep learning in turn has been enabled by the improved computational power (necessary to train these models) over the last decade.
- **Explainable AI:**  
AI, especially deep learning, can be a black box which gives out the recommendation/decision but doesn't state why. There is work happening on embedding explainability into models through techniques like LIME, What If tool etc and will soon become mainstream
- **Data Optimal Models:**  
AI models today are data hungry. With growing regulatory focus, access to data will become difficult in the future. Startups have already started building models that require less data without compromising the accuracy and hence will be the winners.

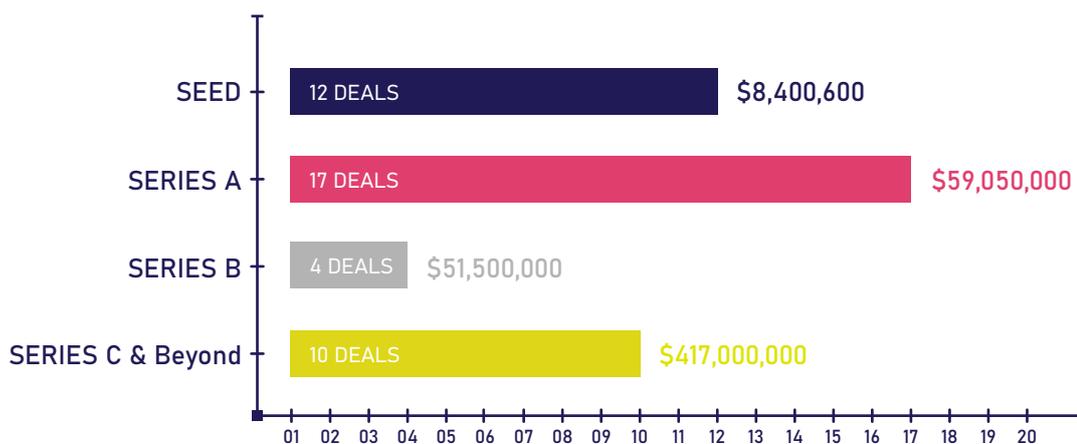
## AI Investments in India 2019-20

	Startup	Amount	Industry	Technology Domain	Function
SEED STAGE	Mihup	\$1,700,000.00	Enterprise Applications	DeepTech Voice Recognition	Customer Experience
	Orbo.ai	\$1,600,000.00	Enterprise Applications	DeepTech - Computer Vision, Image Recognition	Visual Intelligence
	Ambee	\$330,600.00	Environment & Energy	Enterprise IOT	Data Intelligence
	Artivatic	\$160,000.00	Enterprise Applications	PaaS	Data Intelligence
	Shipsy	\$750,000.00	Logistics	Data Analytics	Supply Chain Optimization
	PaisaDukan	\$250,000.00	BFSI	Marketplace / Aggregator	P2P Lending
	Sprint AI	\$500,000.00	Retail	Data Analytics	Enterprise Productivity
	Unbox Robotics	\$550,000.00	Logistics	Robotics	Enterprise Productivity
	Myelin Foundry	\$1,000,000.00	Media & Entertainment	PaaS	Creativity
	SwitchOn	\$1,000,000.00	Manufacturing	Enterprise IOT	Enterprise Productivity
	Keito AI	\$160,000.00	Enterprise Applications	Automation Software	Enterprise Productivity
	Veda Labs	\$400,000.00	Retail	DeepTech - Computer Vision, Image Recognition	Data Intelligence
SERIES A	Vphrase	\$2,000.00	Enterprise Applications	Software	Business Intelligence
	Frontdeskai	\$2,000.00	Consumer Internet	Automation Software	Customer Support
	Niki.ai	\$2,000.00	Consumer Internet	Conversational AI	Customer Support
	Active.ai	\$3,000.00	BFSI	Conversational AI	Customer Support
	Intello Labs	\$2,000.00	Agriculture	DeepTech Image Recognition	Supply Chain Optimization
	Shortlist Professionals	\$2,000.00	Enterprise Applications	Conversational AI	Human Resources
	Doxper	\$4,000.00	Healthcare	Digitization	Enterprise Productivity
	Samya.ai	\$6,000.00	Retail / CPG	SaaS	Enterprise Productivity
	Zvesta	\$5,500.00	PropTech	SaaS	Customer Experience
	Flickstree	\$3,300.00	Media & Entertainment	Content Publishing	Monetization
	Niramai.ai	\$6,000.00	Healthcare	DeepTech Image Recognition	Diagnostics
	Gnani.ai	\$2,000.00	Enterprise Applications	DeepTech - Voice	Customer Experience
	OS Labs (Indus OS)	\$5,750.00	Telecommunications	PaaS	Mobility
	Silvan Innovation Labs	\$2,000.00	Home Automation	DeepTech - Voice	Customer Experience
	WYSA	\$2,000.00	Healthcare	Conversational AI	Personalized Care
	FireFlies AS	\$5,500.00	Enterprise Applications	Automation Software	Enterprise Productivity
	Signzy	\$4,000.00	BFSI	Digitization	Enterprise Productivity

	Startup	Amount	Industry	Technology Domain	Function
SERIES B	WhiteHat Junior	\$10,000.00	Education	Content	Personalized Learning
	RenewBuy	\$19,000.00	Insurance	Aggregator / Marketplace	Sales
	Tricog Health Services Pvt. Ltd	\$10,500.00	Healthcare	Hardware	Diagnostics
	DeHaat	\$12,000.00	Agriculture	Aggregator / Marketplace	Sales
SERIES C & BEYOND	C SigTuple	\$16,000.00	Healthcare	DeepTech - Computer Vision, Image Recognition	Diagnostics
	C Locus.sh	\$22,000.00	Logistics	Data Analytics	Supply Chain Optimization
	C DailyHunt	\$25,000.00	Media & Entertainment	Aggregator	Service
	C Mad Street Den	\$17,000.00	Retail	DeepTech - Computer Vision, Image Recognition	Enterprise Automation
	C Qure.ai	\$16,000.00	Healthcare	DeepTech Image Recognition	Diagnostics
	C Observe.ai	\$26,000.00	Enterprise Applications	DeepTech Voice Recognition	Customer Experience
	D Uniphore	\$51,000.00	Enterprise Applications	DeepTech Voice Recognition	Customer Experience
	D Loginext	\$39,000.00	Logistics	SaaS	Supply Chain Optimization
	F Icertis	\$115,000.00	Enterprise Applications	Cloud	Knowledge Management
	F Embibe	\$90,000.00	Education	Test Prep	Personalized Learning

## Summary [Note: We have considered only deals above \$150,000]

Over the next few pages, we have analysed some of the top AI investments in India, that have raised in excess of \$150,000 since January 2019. Covering 43 deals, we have further classified this as follows:



**Total No. of Deals: 43**

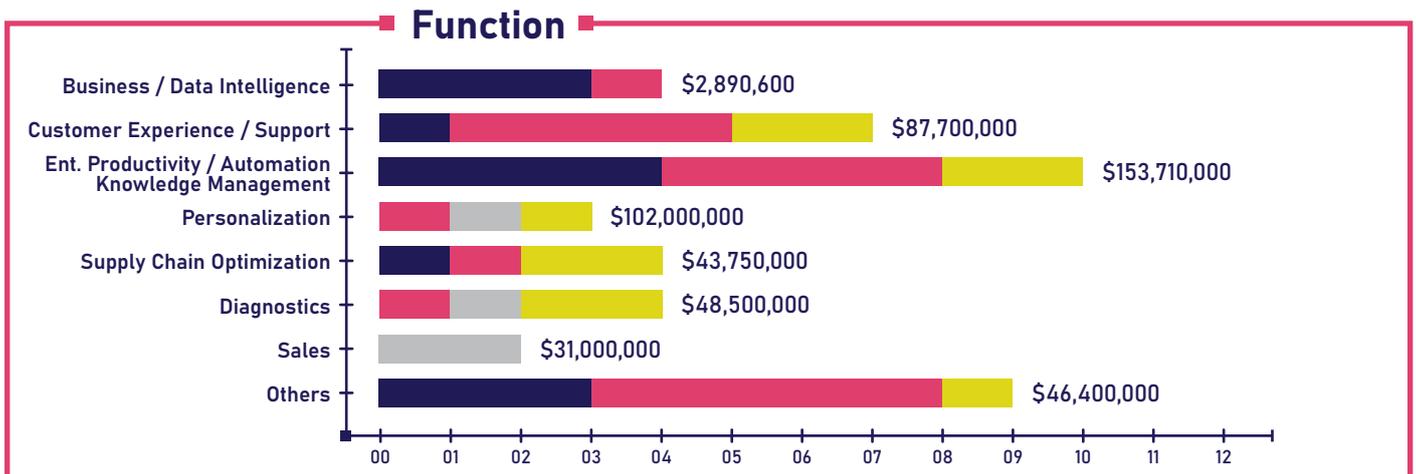
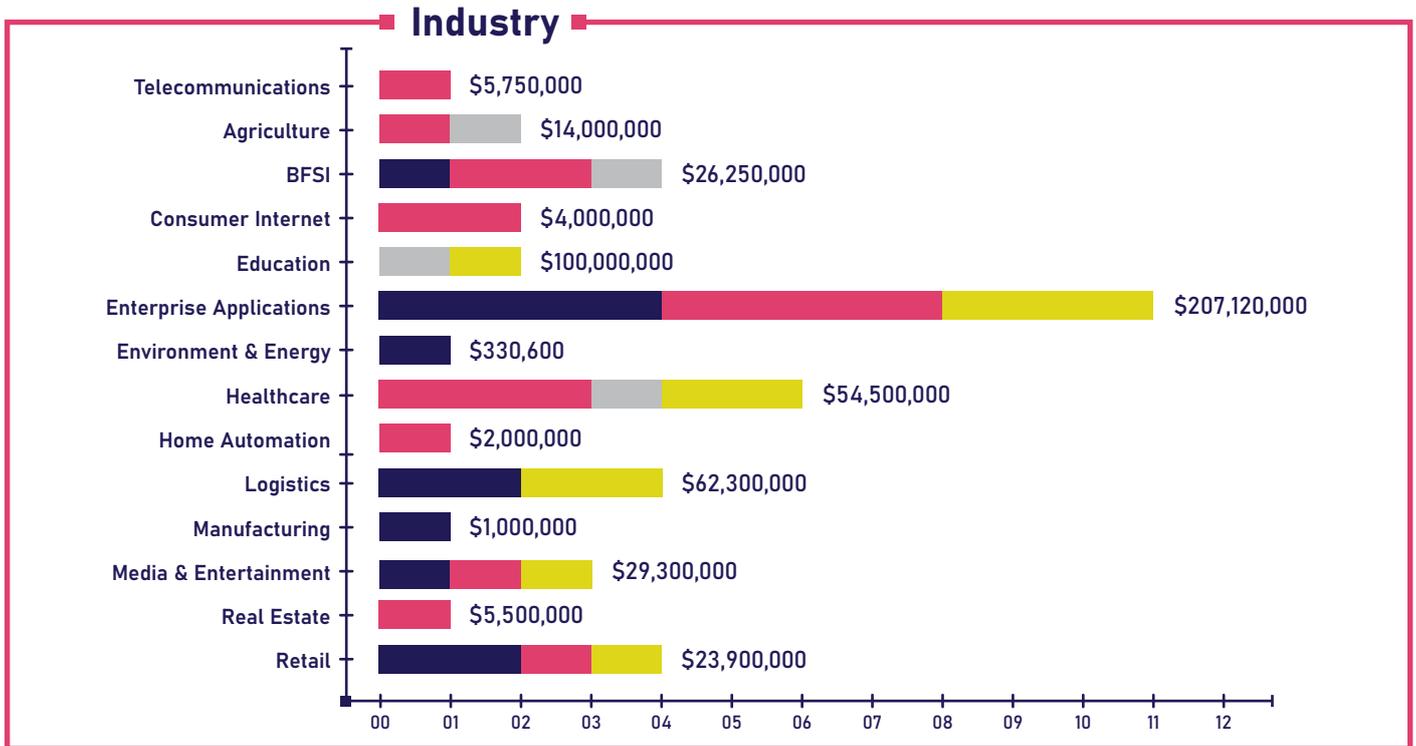
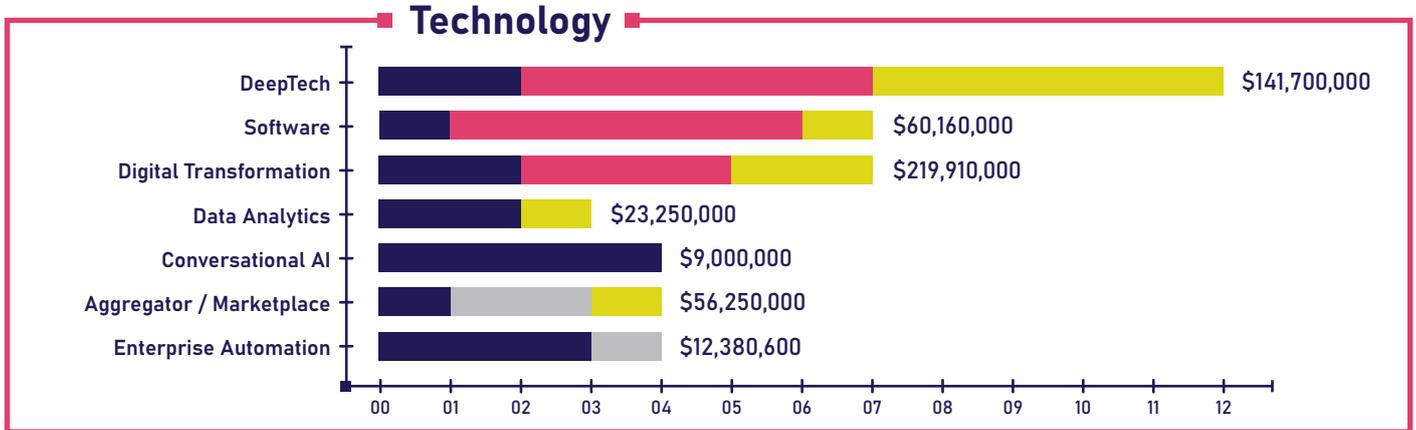
**Total Value: \$535,950,600**

SEED STAGE	0 - 600,000
SERIES A	600,000 - 7,000,000
SERIES B	7,000,000 - 20,000,000
SERIES C & BEYOND	20,000,000 +

Seed Stage Series A Series B Series C & Beyond

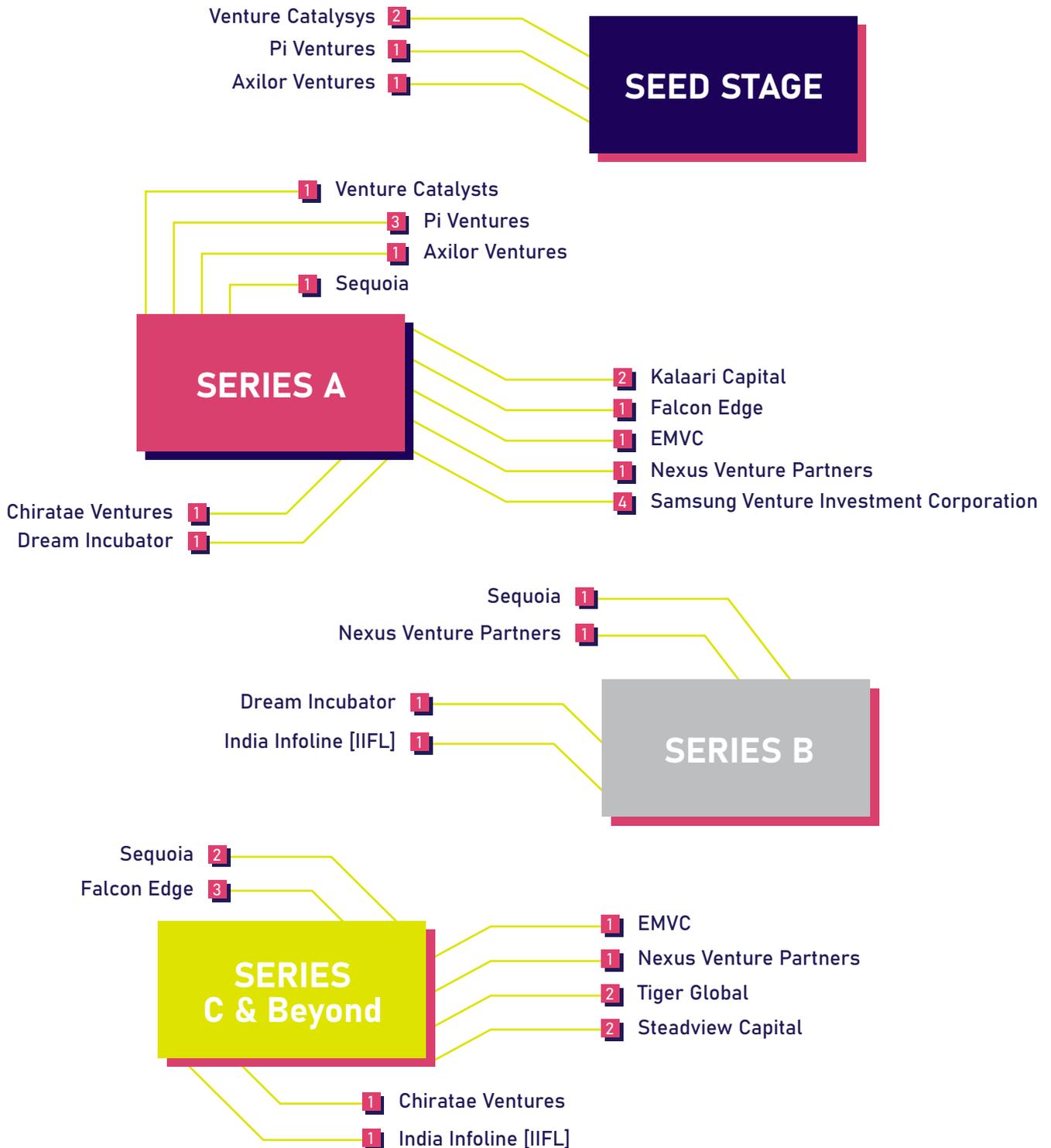
# Technology, Industry & Function Wise Break-up

Analysing the investments from different angles gives us some unique insights w.r.t, application of AI as a technology in a few industries and how it has picked up over time. AI is a broad topic, and therefore evaluating each investee company from the core technology perspective, throws light on industry response to new technologies and lastly, looking at investments from a business function perspective, helps us understand which type of problem-solutions have attracted more capital.



## Who is Investing in AI?

If you are an AI-first technology company, you must know who the investors are actively backing startups in the AI space. Here's a quick look at some of the deal-makers in the AI space. Interestingly, while there are a good number of "seed" stage investments, a much higher percentage of Series-A and beyond rounds, truly is a good sign for entrepreneurs building technology-first products, driven by AI.

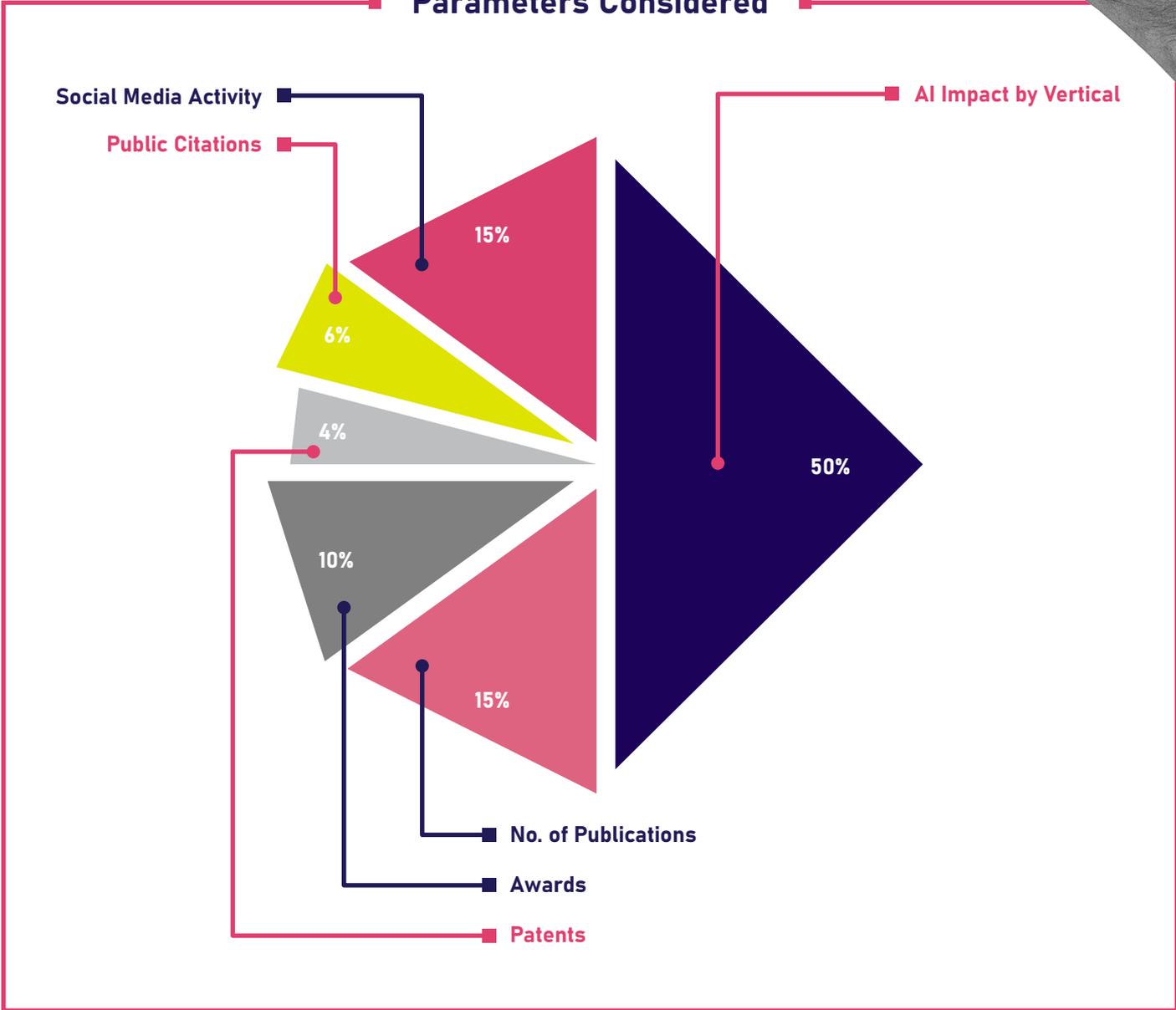


# India's Top-20 AI Influencers

We have compiled a list of top influencers from India, in the field of AI and ML. We have included academics, researchers, entrepreneurs, investors and authors. While there are a few parameters that we have broadly considered - firstly, these are the people with not a huge social media following but, more-so, with an independent voice that is not just directly linked to the companies they work in or they have founded. Secondly, we have also looked at the consistency of their work over the past few years, and tried to cover a few different backgrounds. The order of listing does not represent any sort of ranking.



## Parameters Considered



## Approach for finalizing the Top 20 Influencers

### STEP 1

Going through the past award nominee & winners, industry publications, govt. and public citations, Patents, and Social media activities to identify the reputed & pioneered people, in AI across Industries, Emerging Start-ups, and Academia/research. Reputation is analysed by their initiatives, ground-breaking concepts led across the AI value chain in the recent past.

### STEP 2

After collecting and identifying people from the above, individual information is gathered on the below parameters:

- No. of Publications and patents.
- Association with the Industry value chain and their contribution to the growth and transformation.
- No. of symposiums and summits, individuals made as a jury / spoke.
- Articles and publications where the individuals' concepts got a recurrence across LinkedIn and Twitter.
- No. of followers and re-tweets / re-share of individuals' concepts.

### STEP 3

Arrived at ranking through Score card mechanism using weighted score methodology on different parameters.

The four verticals that we have considered, are as follows:

**ACADEMIA / RESEARCH**

Personas contributing more towards research publications and mentoring, helping industries and business to ideate and transform.

**EMERGING START-UPS**

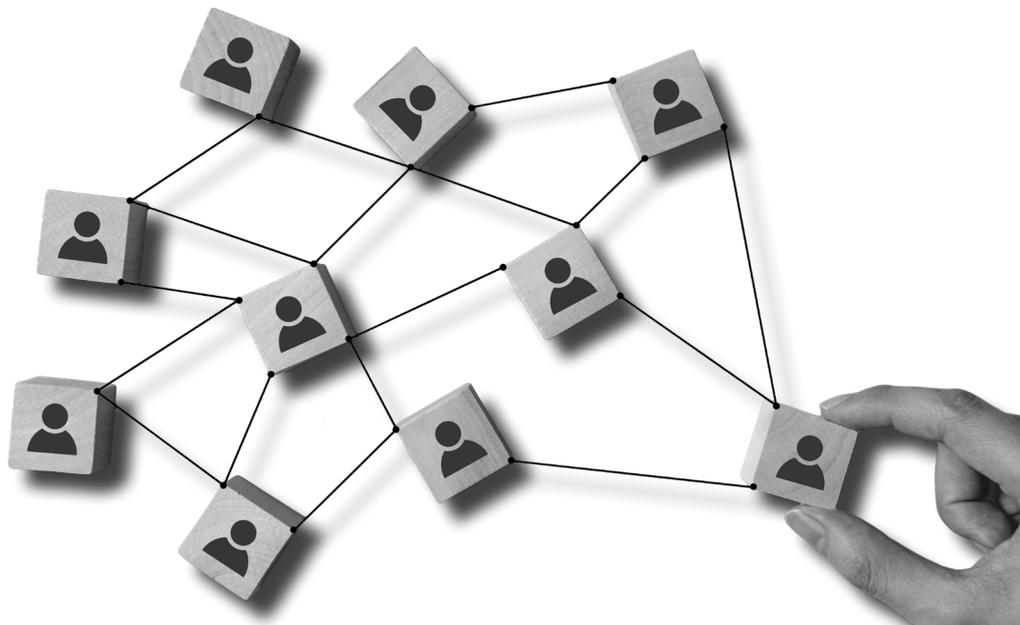
Start-ups, with innovative concepts, influencing the sectors like Agriculture, Healthcare, Education etc.

**GOVERNMENT**

AI Initiatives, across G2B, G2C, enabling better life in society.

**INDUSTRY**

Technology game changing initiatives, implemented in manufacturing industries.



# Top 20 AI Influencers in India

Recognising the Changemakers and Visionaries in the AI Ecosystem

## EMERGING START-UPS



**Geetha Manjunath,**  
CEO & CTO,  
NIRAMAI Health Analytix

### Healthcare [Affordable Breast cancer test through Portable kits in India]

Geetha Manjunath, the lady behind the development of the breast cancer screening software solution, called Thremalytix, a patented technology, a computer aided diagnostic engine powered by Artificial Intelligence, using machine intelligence over thermography images, identifies the cancer at early stage with minimal human intervention and supervision. The innovative methods used in the solution, have led to multiple US patents.

The novel algorithms have also been peer-reviewed in international scientific conferences. Thremalytix, is used as an engine to analyse the patient's breast health condition, through the web interface called SMILE (Software with Machine Intelligence for Life Enhancement), where in, a lab technician upload demography information about the patient along with her thermal images.

## GOVERNMENT

### e-Governance initiatives at Government

Santosh Misra is the Chief Executive Officer of Tamil Nadu e-Governance Agency (TNeGA), the State nodal agency for all the e-Governance initiatives of the State of Tamil Nadu. He played a crucial role in successfully implementing initiatives like:

- **Face Recognition System** for attendance in government schools.
- **Pest Control System** to help farmers to diagnose the pest infection in their crops and provide them with remedial measures through an interactive app Uzhavan.
- **Rural drinking water supply monitoring system** a low-cost rural drinking water supply and monitoring system using cost-effective IoT sensors. This system works using artificial intelligence and machine learning techniques.
- **AI based Street Light monitoring system** for timely replacement of failed components of streetlights (It is in development phase).
- **Smart conversation assistant** a chatbot which will guide and advise people by answering their queries on government services.



**Santosh Misra,**  
CEO Tamil Nadu,  
e-Governance Agency  
(TNeGA)

## GOVERNMENT



**Arnab Kumar,**  
Program Director,  
Frontier Technologies,  
NITI Aayog

### Strategy, Policy & implementation initiatives in AI, Blockchain and Digital Economy

Arnab Kumar is a Program Director of frontier technologies for NITI Aayog, one of the Government of India's premier strategy and policy institution. He is leading Government of India's strategy, policy and implementation initiatives in Artificial Intelligence, Fin-Tech and Blockchain.

He has also co-authored India's National Strategy for Artificial Intelligence (released in June 2018) and contributed to India's e-Commerce Policy and Draft Crowdfunding and Alternate Capital Raising Platforms Policy. His key initiatives include:

- **India-UK Healthcare AI Catalyst:** AI-based HealthTech solutions in areas of diabetes, cardiovascular diseases, cancer and eye-care.
- **Imaging BioBank for Cancer:** AI-based radiomics solution for screening and diagnosis of cancer.
- **Advanced farming advisory** using AI and satellite data.
- **Fertiliser subsidy supply chain** on Blockchain.

## GOVERNMENT



**Utkarsh Singh,**  
Founder & CEO,  
DronaMaps

### Geographic Information Systems [3D mapping]

Utkarsh Singh, Founder & CEO of DronaMaps, developed a platform using AI technology to map out regions, cities and villages to form a highly accurate, interactive 3D maps of physical infrastructure and assets. They aerially collect data using UAVs (drones) in a given area, these pictures are then reconstructed using proprietary algorithms and software platform. So, the maps created are dense in information and highly instinctive.

Amazing things which Utkarsh came up with:

- Built an enhanced version of Dynamic Programming based Bowtie2 which beat the current 3B+ base pairs long genomics analysis speed.
- He also Worked on identifying and reducing Cancer tumors at the Johns Hopkins Medicine and analysed the Hppo-growth pathways based on reversed GFP growth in Drosophila wing-discs.

## EMERGING START-UPS

### Robotics [Elimination of manual scavenging from the society through Robotics]

Rashid Bin Abdulla, Co-founder & Director of GenRobotic Innovations, developed robotic exoskeleton solutions, using RC Controlled Humanoid Robotic Systems and AI. He played an active role in developing three product variants Bandicoot, G-BEETLE - Manhole Monitoring System, and G-Product suite, aiming to eliminate manual scavenging from the society.

The AI powered robot Bandicoot can be dropped into manholes to unclog them and scoop out the debris, which is then transported to waste dumps. Working like a bot, it uses machine learning and artificial intelligence to determine the amount of unclogging needed. Bandicoot can complete the work in 45 minutes which would take three to four hours if done manually. The Manhole Monitoring System (MMS) is a complete sanitation solution which monitors the manhole network, collects the crucial data and process it using machine learning and AI technology to give an overall idea about the health of the manhole and giving an alert when it is getting clogged/overflowing. The MMS will also provide with updates for the routine maintenance of the manholes.

G2 is a battery-powered functional exoskeleton (robotic suit) which can be used in multiple applications that require additional power and protection and this comes up at a cost of just INR. 51,000/-. The company claims, this is the cheapest and strongest exoskeletons available in the world.



**Rashid Bin Abdulla,**  
Co-Founder & Director,  
Genrobotic Innovations

## EMERGING START-UPS



**Deepak Pareek,**  
Founder & CEO,  
DigiAgri

### AgriTech [Digital Farming Solutions]

Deepak Pareek, the techno-preneur since 20 years and the CEO of AgTech start-up, named Digi Agri a Sustainable Agriculture Platform that enable farmers to be more profitable by growing more crop using minimum water, per drop, lesser land, per acre, and reducing cost of cultivation, Per Dollar.

Digi Agri is a collaborative platform that strives to combine Digital Transformation Technologies (Big Data, Machine Learning, IoT, Blockchain, Computer Vision etc.), Innovative Business Model (Agriculture Platform As A Service), and Focused Human Efforts (Agriculture Insights, Products, and Services Delivery through Agri-preneurs) to serve smallholder farmers.

It also allows the Agriculture Ecosystem players like Government, NGOs, AgTech Companies, Commodity Buyers, Crop Insurance Companies, Banks and Financial Institutions, Extension Service Providers, Co-Operatives & FPOs, Agri-Input Companies to deliver their offering through data-driven decisions, keeping farmers at the center stage.



**Utpal Chakraborty,**  
Head of AI,  
YES Bank

#### Fintech [BFSI, Digital Transformation]

Utpal Chakraborty is one of the renowned Data Scientist and AI researcher, having more than two decades of industry experience. He is demonstrated few completely out-of-the-box hybridized Agile & Lean implementations in different industries, out of those his implementation framework for movie productions and government enterprises are remarkable and appreciated by the agile & lean communities across the globe. He is currently working with YES BANK as a Head of Artificial Intelligence. He mentored more than 10 Tech start-ups at different stages. He contributed more on AI Startups, Premier Tech Colleges, and Universities. Helped IITs, IIMs and University on their research in Machine Learning, Deep Learning, Computer Vision and cognitive studies. Assisted industry analysts on different surveys and played advisory roles in the bodies under the patronage of Govt. He is also a well-known speaker, Writer and a futurist. Specialized researcher on Artificial Intelligence, Agile and Lean speaking at conferences around the world.

He also published 70+ technical articles on AI, Machine Learning and Agile in many different premier publishing platforms like Indian Express, Times, APAC CIO Outlook, Swiss Cognitive, Elets BFSI, Global CXO etc. Two books, "Practical Applications of AI in Banking & Finance" and "AI and the Fourth Industrial Revolution" are under development.

#### EMERGING START-UPS

##### Homeland Security Domain

Atul Rai, Co-founder and CEO at Staqu Technologies, played an active role in the development of proprietary AI technology, helping police and law enforcement teams in tracing criminals. This technology is comprised of advanced image analysis, language & text independent proprietary speaker identification engine, facial recognition & text processing which also include name entity recognition, sentiment analysis. The organisation, Staqu, also provides summarize APIs, which can be used by various other firms as well.

This AI technology also offers Smart Glasses for helping the police forces to ensure optimum security at live events such as political rallies, conferences, and processions. Currently, the solutions are used at Rajasthan, Punjab, Uttarakhand and Uttar Pradesh.

At present, the technology is handling over 90,000 criminal records and helping police forces solve over 100 high-risk and complicated cases in India. The company is also helping Dubai police which is aiming to reduce the crime rate to 25% by 2021. In the current crisis of Covid-19, Atul, has also come up with a product called JARVIS, adapted by this AI technology, to identify people flouting social distancing norms, measure body temperature, and help doctors monitor patients.



**Atul Rai,**  
Co-founder and CEO,  
Staqu Technologies

#### EMERGING START-UPS



**Krishna Kumar,**  
Founder & CEO,  
CropIn Technology

#### AgriTech [Digital farming solutions]

Krishna Kumar, the man behind the CropIn, a B2B full-stack Agri-tech organization, enables data driven farming, connects technology to farmer data and provides it to farming companies, seed production companies, agri input companies, banks, insurance companies, government bodies and development agencies.

He also developed the predictive and prescriptive solution, 'SmartRisk™' that leverages AI, ML and Big Data Analytics to enable the user to detect crops, predict crop health, and estimate yield ahead of the harvest, resulting in providing valuable insights for the agri industry, financial institutions, growers and policy makers.

The solution has been successfully running with over 185 plus clients across 30 countries, in Asia, Europe, Africa, and the Americas, enriching the lives of over 2.1 million farmers by digitizing over 5 million acres of farmland.



**Chandrasekhar K,**  
Founder & CEO,  
Forus Health Pvt. Ltd.

#### Healthcare [Eradicating Preventable Blindness]

Chandrasekhar started Forus Health aiming at Eradicating Preventable Blindness using AI and ML technologies, through screening people especially in rural and remote areas and advising them for further precautionary steps to prevent blindness. Forus Health helped Karnataka Internet Assisted Diagnosis of Retinopathy of Prematurity (KIDROP) under India Mass ROP screening program. The program uses eight 3nethra neo wide-field imaging systems to conduct eye screening programs in more than 30 Government NICUs in Karnataka. This has resulted in Cost-effective, timely detection of early stages of ROP, which reduced the burden of infant blindness on society.

Forus initiated "India Eye screening on wheels" through which an optometrist can carry the device on a motorcycle which navigates narrow streets and visit inaccessible places like slums to perform regular tests and counselling. With the help of active screening and point-of-care diagnostics in the community, played major role in improving the health situation of the residents. Till date, Forus Health impacted more than 5 Million, across 36 countries and 2,400+ installations, with over 5 products.

#### EMERGING START-UPS

##### Ed-tech [Comprehensive coaching solutions to Engineering, Medical, Banks, and Railways]

Aditi Avasthi, the lady behind the development of AI powered learning and score improvement platform which helps students appearing for competitive exams (MCCE) like JEE Main, JEE Advanced, BITSAT and CET/AIPMT etc. This platform uses analytics and AI, capturing students' weakness centred on critical exam performance metrics like accuracy, speed, time management, stamina, attempt planning and confidence. It also uses self-learning algorithms, machine learning and cognitive computing similar to IBM Watson.

She ventured her pilot with the tribal students of Rajasthan, who were unknown to computers. The project got succeeded with the tribal students cracking the most competitive pre-engineering and pre-medical exams in India. Currently, the company opened up their platform to other players who are looking to personalize their content offerings to students through their APIs. This platform impacted the lives of 15 million of students.



**Aditi Avasthi,**  
CEO / Founder,  
Embibe

#### EMERGING START-UPS



**Pratiksha Gupta,**  
Founder & CEO and  
Speech Therapy Expert,  
1SpecialPlace

##### Healthcare [Speech Therapy]

Pratiksha Gupta, the CEO of 1SpecialPlace has developed an application called Speech Doctor a tele practice platform that allows self-diagnosis, such that the parents can detect speech and language anomalies in their children through a research-based questionnaire where they have to only decode "yes or no" to the questions and the test results are displayed in a color-coded format indicating the levels of speech difficulties in a child.

The app can be accessed in English, Hindi and Kannada languages with video tutorials, DIY answers, suggestions and recommendations. 1SpecialPlace has expanded its client base to 50,000 downloads across the states in India.

She has over 15 years of experience and is a certified Tele-practitioner with a Gold Medal from All India Institute of Speech & Hearing, Mysore.

## INDUSTRY



**Sudin Baraokar,**  
Industry Expert, Global  
IT & Innovation Advisor,  
CIO

### BFSI [Fin-tech, Digital Transformation in Banks]

Sudin Baraokar is the person behind introduction of digitally enabled services for money payments, collection, lending and securing, protecting, and advisory services in SBI. He has also developed financial services payment switch and cross border remittance appliances offering full range of services to customers across globe.

During his tenure as Innovation head at SBI, the bank embarked on its AI journey started with launch of AI-based solution which scans the facial expressions of customers through AI powered cameras to understand whether the customer is happy or not and thereby communicating with those customers to address the issue. SBI also launched SIA, an AI powered chatbot to assist enquiries from customers instantaneously. He also played a pivotal role in brining blockchain-enabled smart contracts to SBI.

He is currently advising Global Banks and Fin-techs players and is also Chairs the Bankchain Alliance which is established to collaborate and co-develop Blockchain Solutions for around 30+ Global Banks.

## EMERGING START-UPS

### Agri-Tech [AI Powered Robotic solutions]

Jaisimha Rao the man behind TartanSense, is helping the farming community by working at the intersection of robotics and AI assisted computer vision. The company provides small land-based robots for small farms (and smallholder farmers), focused on pesticide application. The robot is a semi-autonomous rover, travel across the fields with a downward facing camera.

The AI/ML system identifies pests using computer vision and then targets the crops, sprays pesticides on them. The rover and its accompanying software will also gather land-based data, at a higher resolution than the drones used to gather, also it generates reports with actionable insights for the farmer on pests. It provides more actionable insights for decision across various stages of crop cycle which helps the farmers.



**Jaisimha Rao,**  
Founder,  
TartanSense

## EMERGING START-UPS



**Saurabh Kumar,**  
Founder & CEO,  
AgricxLab

### AgriTech [AI Powered assessment to agri produce]

Saurabh Kumar, the person behind the development of an online marketplace called AgricxLab, where farmers and traders can sell their produce to B2B buyers. The mobile application of the product uses Computer Vision and Artificial Intelligence on crop images to yield quantity assessment of agri-produce.

He also played a crucial role in the development of Agricx-Inspect application, which converts a simple smartphone into an advanced quality assessment tool. This stand-alone application can be used by an individual or an enterprise for Instant, objective and repeatable quality analysis from an image of the produce sample. This application uses a portable and affordable spectrometer and hyperspectral device powered by proprietary AI algorithms enabling the users to get lab like results in a matter of seconds.

He has had a successful track record of developing innovative and successful business models and delivering a great result for the stakeholders.

## INDUSTRY



**Nilesh Gopali,**  
Founder & CEO,  
AAVOR

### FinTech [e-Commerce and Digital Payments]

Nilesh Gopali, Founder and CEO of the investment and business advisory firm called AAVOR. AAVOR provides international business advisory services for cross-border growth of ventures, especially those where the internet plays a significant role in expansion. He has over two decades of extensive experience in the financial and technology markets. Nilesh recognized by his transnational business experience with his coveted ability to understand both Western and Indian mindsets and business practices.

He is a 'Business Mentor' in London Mayor's International Program, and also holds a post of the Indian National Steering Committee CII for Artificial Intelligence, Future Biz in India & Ecommerce groups. At his capacity of Member of National Steering Committee for AI, CII, he is helping in capitalising the AI growth story across the financial services in emerging markets in India.

He is also a Key Note Speaker across most of the leading Fin-tech and investor forums and addressed more than 50 premier conferences on Fin-tech, AI, and RPA across India and Europe. He has published more than 10 publications on AI and B2B payments.

## INDUSTRY

### Manufacturing [Power plants]

Asha Poullose Johnson, VP & CIO for GE Healthcare, is responsible for driving business growth and internal productivity through digital transformation of the business. She addressed the problems of GE's power plants, by introducing digital transformation platform called BOLT.

The platform acts as a digital co-worker, uses Machine learning and data science models for exploratory, descriptive, predictive & prescriptive analysis aiding problem diagnosis and providing recommendations to engineering team, bringing revenue and operating margins.

On plant side, this enabled in reducing the plant's equipment downtime and improve power output generation. On plant operations, this has reduced the overall turnaround time by 95%, and improved workforce productivity by 20%.



**Asha Poullose Johnson,**  
VP & Global CIO Data  
Analytics, GE Healthcare

## EMERGING START-UPS



**Sethuraman T A,**  
Co-Founder,  
Jungroo Learning

### Ed-Tech [Student learning solutions]

Sethuraman, Co-founder of Jungroo Learning, developed an AI powered platform, comprising of adaptive learning platform, adaptive assessment engine, and Automatic Question Generator in identifying the challenging areas of school going students, at microscopic level of precision.

The AI platform is based on the Discounted Markov Decision Process, helps in identifying the learner precisely, and creates the shortest learning path to mastery the concepts. The platform mimics a virtual teacher to generate micro-level mastery information of students. Each student will have a customized path for learning and teachers will have a customized teaching plan for every student based on their criteria, level of understanding, and score. This platform also, seamlessly communicate with stakeholders like parents, teachers and organizational heads to assess the student from time to time.

Besides basing its intelligence on a student's state of knowledge, the platform also collects new information from the student's ongoing engagement such as the time spent, type of response, the correctness of the questions for a student and the relative performances, percentage scored, interactions of the class to calculate the overall score of the student comprehensively.



**Anand Deshpande,**  
Founder & CEO,  
Asquared IoT

### Manufacturing

Anand Deshpande is a Founder and CEO, of Asquared IoT. Asquared focuses on analytics and algorithms for Industrial Internet of Things (IoT). It uses state-of-the-art Machine Learning techniques (including Deep Learning) to explore data from Industrial IoT, to gain insights from the data, to identify anomalies and machine/process failures, and to derive useful information including probabilities of failures. Their platform is also used in IoT applications in manufacturing industry and vehicle analytics.

Anand has more than 20 years of experience of working in world-class research labs covering diverse areas including parallel computing, computational sciences, mathematical optimization, algorithms and he is specialized in numerical methods, operations research, multidisciplinary design optimization, physical design technologies, and electronic packaging.

He has published several publications in tier-1 journals and conferences in areas ranging from electronic packaging to parallel computing. And also awarded with "Outstanding Paper Award" at IEEE EPTC 2008, a tier-1 conference in electronic packaging.

## EMERGING START-UPS

### Research and Consulting

Romal Shetty is the President, consulting at Deloitte India has 20 years of experience in advisory services across large scale digital transformation programs covering the business and technology domain and has worked in over 30+ countries across risk and consulting domain.

Romal's key focus areas are financial and operational turnaround, customer experience, product innovation, revenue management, analytics, business continuity, risk management, cost reduction, managed services and process reengineering. He is also a Fellow Member of the ICAI and a Certified Information Systems Auditor.



**Romal Shetty,**  
President,  
Deloitte Consulting

## Economics of AI

Artificial Intelligence is a Prediction Machine, which predicts the output of the data by using the information “data” you already have.

Economics provides a well established foundation for understanding uncertainty and what it means for decision making. As better prediction reduces uncertainty, economics tells you what AI means for the decisions you make in the course of your business.

Simple Economics which everyone is aware of runs on “Law of Demand and Supply”.

Similarly AI runs on the law of Demand and Supply.

AI makes things cheap that were once expensive. AI has helped in making predictions cheap.

## AI For Good

AI has the potential to Solve Social Challenges at Scale, by leveraging computer vision, NLP, deep learning applied to traditional databases, as well as other AI capabilities. As per UNDP, there are close to 200 cases of AI’s actual or potential uses for noncommercial benefit of society. Earlier in the report, we have mentioned briefly about how Jio Haptik has leveraged its conversational engine to provide for citizen queries during COVID-19. Likewise, in China, Baidu Inc. alongwith Medvii has developed an AI based temperature scanning device to screen subway pax for coronavirus. Solutions like these are classic examples of AI for Good, with a focus on addressing the current scenario at hand.

However, many of the AI for Good programs are with a longer term impact. Microsoft Research is doing path-breaking work adding data and AI to layers of maps and mapping systems, for saving lives and livelihoods in developing economies. Google has recently announced six AI-based research projects in India in an effort to focus on addressing social, humanitarian and environmental challenges in sectors like healthcare, education, disaster prevention, and conservation. All the 17 UN SDG’s have tremendous use cases for application of AI to solve humanitarian issues, that can make the world more equitable and a better place to live in.

Several of our featured startups (Top-100 AI Startups) and Founders (Top-20 AI Influencers), such as Intello Labs, Jungroo Learning, Tricog Health, mFine, Cropln Technologies, Netradyne, WaterQuest are all solving common & complex problems in the public domain, that can change a Billion lives.



## Denmark - A European Tech Hub

### Why Denmark

Denmark has confidently been riding the waves of digitalization and emerging technologies through the years. Denmark has one of the most digitalized public sectors in the world, with a strong tradition for collecting data, a strong data structure and a strong digital infrastructure. This has made Denmark a digitally advanced country and one of the most digital societies and economies in the world. This is, also recognized around the world through different benchmarks and analysis. One example is Denmark's 4th place in Cisco's Global Digital Readiness Index and EU's Digital Economy Index (DESI). That measures how well positioned countries are to take advantage of digitalization. Areas like a state of the art technology infrastructure, ease of doing business and technology usage, where highlighted.

In March 2019, the Danish government revealed their first nation-wide strategy for AI, with the vision of; "Denmark must take the lead in responsible development and application of artificial intelligence". The strategy focuses on ensuring that Denmark will stay in front on ethical and responsible AI with a human-centric focus, by allocating resources for: responsible AI development and Research, a number of signature AI-projects in the public sector, a common Danish language resource, more open public-data and a stronger investment pool for Danish AI companies. The following four areas have been prioritized as strategically important – healthcare, energy and utilities, agriculture and transport.

This solid digital foundation makes Denmark a place of well-educated, innovative and tech-savvy employees, with a high adoption rate of new technologies and a positive view on emerging technologies like AI and robotics.



**MINISTRY OF FOREIGN AFFAIRS  
OF DENMARK**  
*Invest in Denmark*

### Danish Strongholds and Clusters

In Denmark clusters, that consist of public and private organizations, drives innovation on a local level. The Technology clusters are centered around the Danish universities in Aalborg, Aarhus, Odense and Copenhagen. The Danish Universities are leading globally in specific AI sub-disciplines like Natural Language Processing, Algorithms, Machine Learning, Data Mining, Signal Processing, Complex Systems and Cryptography. The Danish universities are ramping up their investment in AI-related teaching and research, to ensure future competencies and talent mass. In 2021, they expect to have increased their AI degree-granting programs by 23%. What characterizes the Danish AI-research is the extensive focus on applied AI-research, rather than on developing underlying technology.

### Solid Foundation for R&D in AI

Denmark provides access to world-class AI research and an attractive talent pool acknowledged for its user-driven innovation approach and ability to integrate complex software systems. A long and strong tradition for public-private partnerships gives unique partnering opportunities with leading Danish research institutions in the development and deployment of AI and machine learning. Denmark has a growing industry with a myriad of innovative start-up companies. The Danish tech eco-system have fostered strong tech companies, like: Tradeshift, Unity Technologies, ZenDesk, SiteCore, Podio, Unsilo, Corti and so forth. Being a small and open economy, the Danish AI startups and tech-companies primarily serve international customers and are always looking for new partnerships to co-develop solutions and grow internationally.

Centrally placed in Europe, Denmark is an excellent place for developing, testing and applying AI within highly digitalized application areas like e.g. Healthcare, Robotics, Agriculture, Finance and so forth. As well as, the location gives access to more than +500 million potential consumers.

## Build your AI Adventure in Denmark

Six good reasons to locate your AI activities in Denmark:

- **The Most Digital Country in Europe :**  
Denmark provides excellent opportunities for testing and applying AI within highly digitalised sectors, such as healthcare, sound, robotics, finance, government and agriculture.
- **Some of the World's best Data:**  
Denmark has a long experience with collecting and managing social, economic and environmental data and tops the Open Data Watch global ranking for the quality, coverage and openness of its statistics.
- **World-Class AI Research & Talent:**  
Denmark has a global reputation for its competencies within user-driven innovation and ability to integrate complex software systems.
- **A Vibrant Start-Up Community:**  
A myriad of innovative start-up companies are looking for partnerships to co-develop solutions and grow on international markets.
- **Unique Partnering Opportunities:**  
Collaborative partnerships with leading Danish research institutions are widely accessible for the development and deployment of AI and machine learning in a growing regional market.
- **Ambitious Political Strategies:**  
The Danish government is committed to meeting the need for science, technology, engineering and math (STEM) talents to drive sustainable innovation and growth using digital technologies.

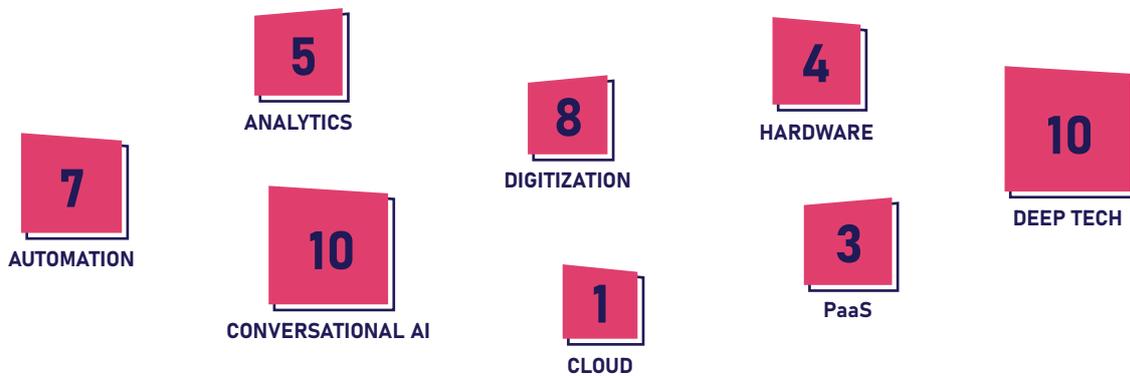


## AI Top 50

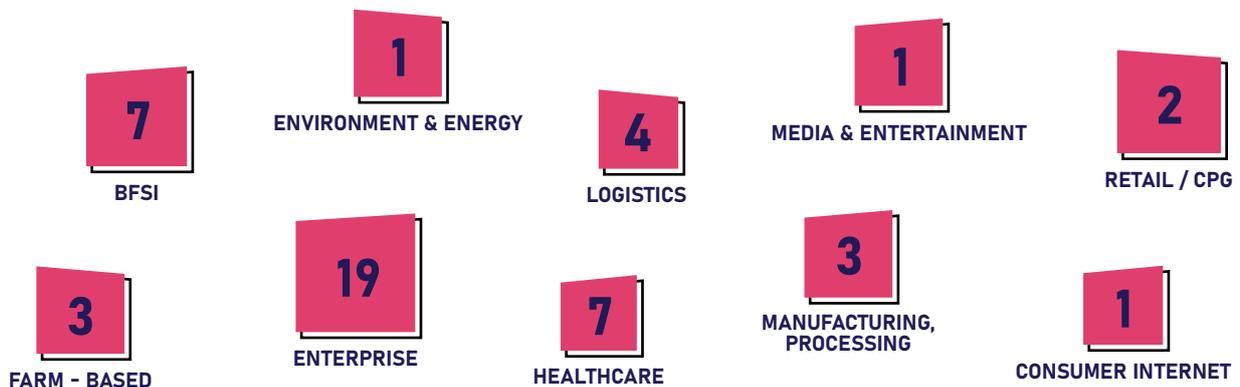
Startups are the key to the technology revolution and the India AI Top-50 aims to identify India's Top-50 startups across industries, leveraging the power of AI to deliver value to enterprise, and bringing about unprecedented developments. With the AI Top-50 we have tried to identify India's Top-50 AI startups on the basis of their impact. The list was culled through an application-based process that asked companies to provide details on their technology, business model, customers and financials like funding, revenue history, team strengths etc. In total, we received over 300 entries. This was supplemented by nominations that we made at our end, purely through investments raised, and on their validation with the EDGE Framework.

We crunched the numbers and ranked companies based on revenues, employee growth, customer statistics, historical funding and valuation. The intention with this initial ranking is to prioritize companies that have shown traction with respect to use of AI as a core-technology, adoption across industries and functional use cases.

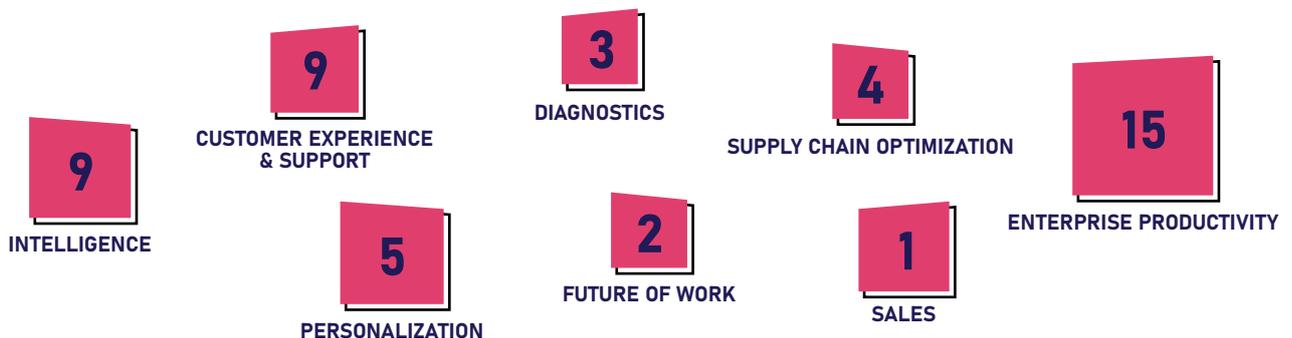
### Technology Domain wise Break-up



### Industry wise Break-up



### Break-up on the basis of Function



# AI Top 50

Startup	Description
	<p>Haptik is one of the world's largest Conversational AI companies, having reached over 100 million devices, and processed over 3 billion conversations to date. Haptik's leading clients and partners include Samsung, Oyo Rooms, KFC, Coca-Cola, Tata Group, Club Mahindra, and Zurich Insurance among others. Haptik is a part of the Reliance group of companies, who acquired a majority stake in the company in a \$100 million deal in April 2019.</p>
	<p>Orbo is a disruptive visual intelligence company that harnesses Computer vision and Deep Learning as its core technologies. Orbo is dedicated towards spearheading break-through research and development in Deep Learning technology, so as to provide unique solutions for artificial intelligence applications and transformational visual perception. With deep facial technology layer at its arsenal, Orbo is focused on blurring the lines between a camera and a human eye by bringing visual perception and transformations to any device. Orbo's Computational Photography and Deep Facial Transformations products address various market segments such as OEM mobile devices, consumer camera, action cameras, drones, surveillance, Embedded Systems, Semiconductor, ecommerce and machine vision etc.</p>
	<p>mTatva helps hospitals to stay connected to patients using our patient engagement bot and provides advanced AI analytics to improve the quality of healthcare and topline. Simbo is an advanced junior doctor robot assisting human Doctors with all mundane jobs so that Doctor focuses on patients only. We use bleeding-edge AI technologies and our proprietary BISLU architecture understands humans like a human.</p>
	<p>Senseforth.ai is a leading Conversational AI Platform providing automated humanlike conversations between organizations and people. We help enterprises acquire, engage and support customers across India, US, UK, Europe, APAC, and MiddleEast. Senseforth.ai is the only Conversational AI Platform featured in the top ten rank of the Global Machine Reading Comprehension Leaderboard, SQuAD 2.0, sharing the space with the likes of Google, Facebook and Microsoft.</p>
	<p>BankBuddy is a cognitive banking CX platform for personalised, intelligent &amp; frictionless banking across customer journeys, languages, channels &amp; segments. We fuse Deep learning, NLP, computer vision, big data, recommendation system, and speech analytics with our domain knowledge of working with 100 of banks across 50 countries to enable productised AI implementation in weeks.</p>
	<p>vPhrase provides AI-powered business intelligence and reporting automation solutions using machine learning and natural language generation. Established in 2015, vPhrase is an NLG leader, based in India with a global clientele. Our product Phrazor summarises data into a few bullet points, highlighting key insights for decision making. We equip enterprises to transform complex data into easy-to-understand reports with language narratives.</p>
	<p>Advenio is a deep tech company solving healthcare diagnostics using AI, machine learning, data science, and advanced image processing. Advenio's innovative software solution works on differential diagnosis to detect crucial and complex diseases from medical images and mitigate uncertainties in interpretation, making it faster, cheaper, and more robust than traditional methods. The Advenio platform is positioned to serve across the panel: from eye and diabetic clinics to insurance and pharmaceuticals. Advenio's AI system significantly restructures the current workflow of hospitals and public health screenings, thereby reducing a doctor's administrative burden.</p>
	<p>Onward Assist helps improve cancer treatment outcomes. Onward enables cancer pathologists and Oncologists with ML-based analytics tools for faster, better reporting. These help extract better prognostic information and with higher accuracy, which are then used by treating Oncologists to take better cancer treatment decisions leading to better outcomes. Onward's AI tools are built in collaboration with leading cancer institutes in India and the US.</p>
	<p>Arya.ai is an enterprise Deep learning platform to automate the complex data science tasks involved while building Neural Network based application or predictive models. It provides an Autonomous AI platform for Financial Services.</p>

Startup	Description
	<p>Intello Labs digitizes quality in fresh produce supply chains, reducing food wastage by detecting variance from specifications and matching output to needs.</p>
	<p>Signzy is an AI powered RPA platform for financial services. No matter how complex your workflow or operational complexity, Signzy is able to completely automate your back-operations decision making process into a real-time API. This is possible due to a combination of Nebula - Our no code AI model builder and our Fintech API Marketplace of over 200+ APIs. Today we work with over 90+ FIs globally including the 4 largest banks in India and a Top 3 acquiring Bank in US. Globally we have a strong partnership with MasterCard and offices in New York and Dubai to serve our customers in the 2 geographies. Our Product team of 120+ people is building a global AI product out of Bangalore.</p>
	<p>Locus is a global B2B SaaS company that automates human decisions in supply chain, bringing supply chains to the forefront of businesses. It offers smart solutions like route optimization, real-time tracking, insights and analytics, beat optimization, warehouse management, vehicle allocation and utilization, and strategic consulting using Artificial Intelligence. Locus has grown remarkably, expanding teams internationally and capturing markets in North America, Southeast Asia, and India.</p>
	<p>HyperVerge builds and deploys AI driven solutions in areas that stand to gain the most from automation, large scale pattern recognition, and novel solutions that were impossible before such as telecom, BFSI, defence, and infrastructure. AI solutions from HyperVerge for real time computer vision intelligence lead the market on accuracy (99.5%) and recall (99.3%) values across geographies around the world.</p>
	<p>CreditMate is a debt collections platform that employs pre-emptive and strategy led intelligence to increase efficiency and resolutions. It provides innovative payment methods and secures cash payments with consent, security &amp; e-receipts. The field agent mobile app optimizes route, task management and gives a real-time view of agents and transactions. Lenders &amp; borrowers highly benefit from our service. Our solution covers all stages of delinquency &amp; all financial segments including SME, personal &amp; home finance.</p>
	<p>Icertis is a software company, providing contract management software to enterprise businesses. The company is headquartered in Bellevue, Washington with 12 offices globally; including an engineering office in Pune, India, new offices in Singapore and Sydney, and 3 support centers.</p>
	<p>Eightfold delivers the Talent Intelligence Platform™, the most effective way for companies to identify promising candidates, reach diversity hiring goals, retain top performers, and engage talent. Eightfold's artificial intelligence-based platform empowers enterprises to turn talent management into a competitive advantage. Built by top engineers out of Facebook, Google and other leading technology companies, Eightfold is based in Noida, as well as Mountain View, California.</p>
	<p>Comsense Technologies was founded in 2014 by a team of ex-IBMers, and it is a global Advanced Analytics &amp; Marketing Technology Company leveraging AI, ML &amp; Data Science. Comsense enables businesses, having an objective to deliver a superior customer experience, to excel at insights-driven customer engagement for maximum business impact.</p>
	<p>We're a 14 month old AI company in Waterloo, Ontario. We work with Prediction and Anomaly Detection for our clients. At the same time we are building Re-Usable algorithms to be an AI Platform for Small/Medium Size Enterprises. Our clients are in E-Commerce and Solar.</p>
	<p>DheeYantra is pioneers in Indian Language NLP (Natural Language Processing). Dhee.AI; the patented cognitive conversational AI bot platform from DheeYantra is the first platform in India that supports building bots (voice and text-based) in Indian Languages, apart from English. These bots can later be hooked on to multiple channels such as conversational IVR, WhatsApp, Alexa, Google Home, Website, etc.</p>
	<p>Wysa is a global leader in AI-driven mental health support. Rated by ORCHA as the top mental health app, Wysa is clinically approved and is recommended in the NHS for the last 18 months. Wysa has over 1.5 million users across 30 plus countries and has delivered a million therapeutic breakthroughs every year - equivalent to over 2000 therapists working full time.</p>

Startup	Description
	<p>CynLr is deep-tech robotic technology startup building an AI (reinforcement deep learning) based H/W+S/W visual intelligence platform, that enables industrial robotic arms to see, understand and manipulate any object even in random unstructured environments. Universal object grasping, and manipulation is an unsolved 30-year old challenge in industrial robotics, a solution to which can disrupt the \$15 trillion manual labour market.</p>
	<p>Myelin Foundry is a deep tech product start-up that transforms human experiences and industry outcomes by building Artificial Intelligence algorithms on video, voice, and sensor data, for edge devices.</p>
	<p>Samya.ai is a Revenue Growth AI company in the CPG space operating at the intersection of demand and supply operations. Samya.ai brings the power of deep learning, probabilistic machine learning and reinforcement learning approaches together with deep domain expertise to help CPG companies recapture revenue growth potential. With purpose-built and interconnected AI SaaS modules, Samya.ai is driving disruptive value and 10X improvement over other solutions.</p>
	<p>Unbox Robotics is building logistics automation solutions using Robotics and AI, with a focus on new-age logistics, which requires systems that are compact, modular, and quick to install. The team consists of alumni from the institutes such as - National University of Singapore, University of York, and Indian School of Business with international experience in robotics, manufacturing, and logistics.</p>
	<p>NIRAMAI has developed a novel solution for detecting early stage breast cancer in women of all age groups. Their solution is radiation-free, non-contact, non-invasive, privacy-aware, portable, affordable and can be operated by minimal skilled health workers. Their core innovation is a technique called "Thermalytix(TM)" which is fusion of artificial intelligence algorithms and advanced thermal imaging.</p>
	<p>Gnani.ai is an AI startup that has been working on building ASR's for leading Indian languages. Gnani.ai aims to empower enterprises with the power of voice. Gnani. Ai's speech to text engine is currently available in Indian English, Hindi, Kannada, Tamil, Telugu, Gujarati, Marathi, Bengali, Malayalam and Punjabi. Our domain specific speech to text engines can be tuned according to your requirements. Our engines can be deployed across industries ranging from contact centers to E-commerce. Gnani's solutions include Enterprise Customer Care Automation, Voice Assistants and Voice biometrics.</p>
	<p>Vymo (getvymo.com) is an intelligent Personal Sales Assistant; it captures sales activities automatically and predicts 'next best actions' intelligently. Vymo has over 100,000 users in 60+ large enterprises such as AXA, Allianz, HDFC Bank, SBI Life, DuPont, and Generali. It is recognized by Gartner as a Cool Vendor and funded by Emergence Capital and Sequoia Capital.</p>
	<p>mfine is an AI-powered healthcare platform that connects you to hundreds of top-notch doctors online. On mfine, we aim to provide instant access to high-quality and reliable healthcare, especially for non-emergency conditions. We have over 0.7 million users who trust the mfine app as a family doctor on the go. Our doctors specialize in various fields and aim at providing the best medical assistance to patients. The average experience of the doctors listed on mfine is more than 10 years. Also, we have tie-ups with the top hospitals in the city to provide accessible and reliable medical care to our users.</p>
	<p>Findability Sciences applies the power of big data, cognitive computing, and artificial intelligence (AI) in its core product: the award-winning Findability Platform®. The Findability Platform makes use of its proprietary technologies to add context to data and incorporates self-learning capabilities to deliver turnkey solutions to major global corporations in the insurance, retail, manufacturing, financial services, trading, healthcare, and transportation industries.</p>
	<p>Marsview.ai is a SaaS company that develops products to extract intelligence from video, voice, image and textual data using advanced AI technologies. The company's flagship product, Marsview Video Notes is used by individuals and businesses to generate meeting summaries, highlights and notes from video conferences, webinars and virtual events. Marsview Video SEO is used by marketers to increase traffic from search engines. The company was founded in early 2019 with presence in Silicon Valley and Bangalore.</p>

Startup	Description
 <b>KARMA LIFE</b>	<p>KarmaLife is an AI-powered, mobile-only solution that provides financial security &amp; resilience to low-income 'digital gig workers' with fluctuating cash flows. It enables employers to motivate and retain their workforce through its plug &amp; play, configurable platform. Today, KarmaLife offers a revolving line-of-credit to smoothen monthly finances as well as tailored insurance to manage risk and limit downsides. The product is designed in a way that is personalized, inclusive, affordable and easy-to-use.</p>
	<p>Air pollution is currently the world's largest killer. Ambee uses data science to build hyperlocal, granular air quality and pollution data. This is used for everything from healthcare and wellness, to insurance and governance. Individuals can use the information to better their health and productivity.</p>
	<p>Rishabh Jain and Aditi Sinha started Locale.ai with a simple question --- if tools such as Mixpanel can enable growth teams to be data-driven, could they help supply and operations teams to optimize their ground operations in a similar fashion? Locale's mission is to help every company with moving assets (goods, delivery partners, sales partners, vehicles etc) increase their operational efficiency and improve unit economics using real-time location data &amp; analytics.</p>
	<p>Aquaconnect was founded in 2017 as a global full-stack Aquaculture technology venture that offers data-driven farm advisory solutions and market linkage solutions to Shrimp and Fish farmers through AI-powered farm advisor app 'FarmMOJO'. Our deep learning models improve productivity, predict diseases and drive the aquaculture industry towards sustainability.</p>
 <b>Pentation Analytics</b>	<p>Pentation Analytics is an InsurTech and Big Data Analytics company with its presence in India, USA and the Middle East. We provide Insurance Analytics Suite – a Business Process Management Suite for Insurance – for carriers and intermediaries such as Banks &amp; Brokers.</p>
	<p>Attentive AI was started by an IIT Delhi core team comprising Shiva Dhawan, Utkarsh Sharma and Sarthak Vijay in 2017. The company was established to develop artificially intelligent systems that can analyze satellite, aerial, street and drone imagery and provide geospatial technology providers and end-users with 2D and 3D vector data.</p>
	<p>ten3T delivers data driven clinical insights using its patented platform of intelligent, medical grade wearables for continuous vitals monitoring and proprietary health analytics to enable predictive, proactive, and effective clinical decisions. Towards this, ten3T has commercialised its AI driven, real time monitoring platform that is in use at multiple hospitals across India.</p>
	<p>Gray Routes AI provides a Supply Chain AI tool that leverages dynamic supply chain and demographic data to sense demand accurately, and recommend optimal inventory and workforce plans to save resources and redeploy for growth. Our novel location data structure, AI algorithms and tools encrypt, compress and securely process extensive location datasets for granular insights to Fortune 500 enterprises.</p>
	<p>Light Information Systems is a company with a vision to change man-machine interactions of the future. A first mover in the AI-NLP space, Light is into research and development of powerful algorithms in NLP and neural nets that help with semantic understanding of text and images. Their enterprise product NLPBOTS automates conversations and processes in the areas of HR (employee engagement, hiring automation, etc.), Customer care, Marketing Assist, Reseller/partner management, Technical support, Lead generation, User validation processes, and much more.</p>
	<p>AjnaLens designs mixed reality glasses to augment human intelligence so that people can realize their full potential. With AjnaLens, Dimension NXG provides solutions for Defence, Education and Large Enterprises. With its patented technology, AjnaLens helps users overcome the limited 2D experience offered by computers, laptops or mobiles. With its mixed reality glasses, these boundaries are fading away, creating new possibilities to interact with the digital world more intuitively and effectively without disconnecting with the room you are in and people you are with.</p>

Startup	Description
	<p>Niki is bringing the household consumption of Bharat online by building the digital localised agent for 500 Mn new to internet users. Niki.AI converts these users into consumers by providing them the agent like experience that is most natural to them. Removing the barriers complicated interfaces, language and inhibitions regarding digital services, Niki assures that users never get stuck online and goes the extra mile to ensure every task is successfully completed. It is a 24X7 support system that encourages people to save their precious time to do things that they love and leave all their digital services-related worries to her, who's much like a local agent.</p>
	<p>Fluid AI is an AI-first company in the digital-first world. AI is applied in many forms, from intuitive bots that self-learn, through to intelligent tools that transform data insights into powerful business solutions. By talking with businesses and listening to their needs, Fluid AI builds AI based products and platforms that turn problems into a business' best asset, through Text ChatBots and VoiceBots.</p>
	<p>Active.AI uses artificial intelligence (AI) to deliver Conversational Banking services. Active AI helps banks and credit unions create intelligent virtual assistants, bringing in automation and insightful customer engagement. The company's conversational banking technology uses advanced NLP and machine intelligence to enable customers to have natural dialogues over messaging, voice or IoT devices.</p>
	<p>CropIn is an intuitive, intelligent, self-evolving system that delivers future-ready farming solutions to the entire agricultural sector. CropIn delivers decision-making tools that bring consistency, dependability and sustainability to agri-businesses. With capabilities of live reporting, analysis, interpretation and insight that span across geographies, we're digitizing every farm, while data-managing the entire ecosystem. CropIn's smarter agri solutions are powered in real-time; for you to archive patterns, predict trends, to make a blueprint for your business in the times to come.</p>
	<p>Detect Technologies aims to assist process industries in driving digital transformation for asset integrity solutions. Detect technologies resides at the intersection of patented hardware and intelligent algorithms and creates value for its industry partners by enabling development of real predictive capability. Detect Technologies' products such as GUMPS have been designed to simply decision making by providing real time insights about assets and especially inaccessible assets and are supported by predictive algorithms to generate real value.</p>
	<p>CamCom is an AI automation platform that harnesses computer vision and deep learning to automate quality checks across the product life cycle using mobile phones and other readily available cameras. CamCom aims to be the preferred quality assurance partner for enterprises across the globe.</p>
	<p>FlixStock has developed a technology to replace model photoshoots. FlixStock's programmatic image generation technology removes the need of hiring models, makeup artists and lifestyle photographers; yet produces garment images with the look of high quality model photoshoots. FlixStock works with multiple US retail majors to reduce their cost of production by upto 75%. These companies also benefit from much faster turnaround time and improved conversion rates.</p>
	<p>SalesKen gives you incredible insights into the last mile of customer-salesperson interactions. See how your sales team communicates with customers on calls, presentations and webinars and get insights into what they are doing right, and where they need help. SalesKen also lets you help your sales team improve with customized learning content to help them up their game and win!</p>
	<p>Leverage Edu is a full stack university admissions service, using AI to help students work with best-matched mentors from around the world in personalized career workshops. We have demonstrated industry-leading student outcomes in the last three years, and now also help students with value added services like education loan, accommodation options, on-campus/ long-term mentoring, and more.</p>
	<p>Flutura focuses on achieving operational excellence through Asset Uptime Reliability and Operational Efficiency across Oil &amp; Gas, Process Manufacturing, Heavy Machinery and Defence. Its AI platform, Cerebra with self-learning capability leverages physics, heuristics, and data science making it an industry preferred product. The platform comprises of Cerebra Digital Assistant for predictive analytics, Cerebra Vision for safety and Engineer's Workbench to bring data science for engineers. Gartner has named Flutura in the first-ever 'Magic Quadrant (MQ) for Industrial IOT Platforms' for two consecutive years and has received highest overall rating (4.8/5) in Gartner Peer Insights 'Voice of Customer' report.</p>



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