

# MBAEx

## BUSINESS REVIEW

**AI at the Helm**  
**Reshaping Industries for**  
**the Future**



**Class of 2024**



**MBAEx Business Review**

Edition#05

**AI at the Helm**  
**Reshaping Industries for  
the Future**

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A year to be remembered



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# Message from Director-in-Charge



**Prof. Saibal Chattopadhyay**

Director-in-charge, IIM Calcutta

It is with immense pride and a sense of anticipation that I present to you the 5th edition of our magazine, Business Review, a testament to the spirit and intellectual prowess of our MBAEx students.

This year, our theme, "AI at the Helm: Reshaping Industries for the Future," is not just timely but pivotal. This edition explores the transformative power of Artificial Intelligence across various sectors, offering a rich blend of articles by our faculty, students, and alumni. Through these pages, we showcase how AI is not just a technological advancement but a catalyst for innovative business strategies and societal progress. As you immerse yourself in this insightful compilation, you will witness the creativity of our students who, with their understanding and their diverse domain experience, have contributed to this magazine. However, this edition is more than just a collection of articles; it's a testament to the possibilities that await us at the intersection of AI and human ingenuity. This edition will also give a glimpse of campus life captured through the lens of our in-house photographers.

I am sure you will enjoy reading this publication.

## Chairperson's Note

The 5th edition has some FIRSTS we are all very proud of. Class of 2013 and 2014 as our alumni feature for the first time in a visual nostalgia collage.

The current batch illustrates its true allegiance to diversity with first-time contributions from the widest spectrum possible: Infrastructure, Manufacturing, Healthcare, Portfolio Management, Energy and Sustainability, CDPs, Automotive, and even SPACE. For the first time, alumni including Amol and Durga present their original use cases for smart manufacturing, Mayank introduces his comic and digital content company, and Nilanjan poetically brings in more advice from his TIKTOK-AdTech experience. We have our Economics Faculty discussing AI disrupting education sector and the impact on digital division of labor.

In the world of AI generated content, MBAEx Class of 24 editors, Hari Priya and Sharath proudly reiterate Jeff Hawkins: *The key to artificial intelligence has always been the representation.* MBAEx Class of 2024 with its 77 auteurs truly stand for representation and versatility.



**Dr. Pragyan Rath**

MBAEx Chairperson

Dr. Rath specializes in Narrative of Things (NoT) in the space of Communications.



# Editors' Note

## MBAEx Review

### Hari Priya Kandukury

It is with great excitement that we present to you the revamped edition of the Business Review dedicated to the transformative impact of artificial intelligence across industries. As future leaders in the age of AI, it is crucial we engage deeply with how intelligent automation is reshaping business models, and operations.

Our cover story, "AI in Education: A Reasoned Speculation", authored by Prof. Runa Sarkar and Prof. Anup Sinha, provides an insightful overview of how AI may impact education.

We are also honored to feature an industry perspective on "AI in Manufacturing" by Amol Shrikant Kulkarni and Durga Madhaba Padhy, our esteemed alumni from Batch 13.

The issue proudly publishes articles from the current batch-Batch 17 Students, who have leveraged their diverse professional backgrounds to examine AI's impact across various sectors like healthcare, finance, energy, power, and space.

*Hari Priya & Sharath*

**Editors**



### Sharath Mirdiddi

We hope you find this edition as insightful and thought-provoking as we did while putting it together.

We welcome your feedback and perspectives at [pgpexbusinessreview@email.iimca.ac.in](mailto:pgpexbusinessreview@email.iimca.ac.in).

Special credits to **Rajdeep Guha** for reviewing the articles.



# AI in Education

A REASONED SPECULATION

**By Prof. Runa Sarkar & Prof. Anup Kumar Sinha**

The onrush of rapid developments in the fields of Artificial Intelligence (AI) and Machine Learning are opening up new vistas in undertaking complex tasks and successfully achieving them at astonishing speeds.

**The next, more sophisticated stage of the information and communication revolution has arrived.**

Most people are eagerly waiting to see unimaginably complicated tasks being done by computers with a great deal of excitement and anticipation, like a grand show about to begin. However, there are a number of critical questions being raised about the impact and consequences of AI on human society. These questions range from negative side effects of AI such as job losses, to more existential ones like whether the new machines will ultimately overwhelm humans and emerge as the new 'species' in the planet's evolution. The debates are intensifying and some people who were active players in the development of the new technologies are warning us about the adverse possibilities of AI. In this context of imminent change with uncertain impacts, questions are also being raised about the future of education, and education systems.

We restrict our discussion in the rest of this essay to the possibilities of expected changes in education. In doing so, we will necessarily talk about the labour market since the education and the job market are intrinsically linked. What follows is reasoned speculation into future trends.

Let us begin at the very beginning. The infant getting into pre-school and kindergarten will soon not have to go to school at all. Not only would we save on the inefficiencies of commuting, we also would shield the child from acquiring infections preventing common ailments that children of yore were accustomed to. A computer could teach and guide the child with special attention on the child's specific talents and abilities. Customized (and optimized) care would be provided which no school-teacher, at the present moment, could provide.

**Teaching and learning resources will move away from books and paper and toys, to things more audio-visual.**

Interactions with other children will be virtual. The child would be nudged by the trainer-computer to play games best suited for the child's innate capabilities.

In short, the child would be exposed to a much greater variety of learning experiences, each designed to maximize their potential for growth, as determined by a more intelligent AI system. The child's ability to socialize and adapt to new situations would be limited to simulated experiences as provided by the trainer-computer. The child is likely to be exposed to new subjects and themes with great randomness and frequent alterations. The speed of learning new things and forgetting the old would be a game-changing characteristic of success in the future. Similar traits would be continued into the secondary level.

Two things are likely to happen at the entry level of education. First of all, access to such educational devices might not be available for all. People with lower incomes will be deprived, just as access to the best schools are limited by economic capability in India now. They may continue with the traditional modes of education, or be imparted education with standardized AI systems with limited customizability. That inequality will remain. The second issue of concern would be the intellectual demands made by the new rapid-learning-and-ability-to-apply-that-knowledge system. The intellectual divide would still be there, probably in a more accentuated form. In this new system, education is unlikely to be universal.

**This will lead to a sharper divide between the employable and the unemployable, as both the economic and intellectual divide manifests itself within the education system.**

In this scenario, eventually, the traditional school could cease to exist as would the classrooms and the teachers. The new school could turn out to be specialized interactive zone with children of exceptional talent who could innovate and share ideas.

Similarly, teachers, much fewer in numbers, would be more of learning coaches than knowledge givers.

**In the field of higher education, the role of teachers who transfer their acquired knowledge to students in classrooms will be over.**

The transfer can be done at home through super-teacher devices, faster and in a customized fashion. The classroom cohorts would still be required to help the each other who make to this level - possibly an elite with sky-high IQs - to attain problem solving skills. The higher education classroom or laboratory will constantly device ways to solve problems of all types, formulating solutions to new problems and new solutions to old problems. Problems would be solved through simulation exercises in safe settings, as well as through immersion into a problem for a longer time and with more risky, real-world settings.

One thing to note here is that the distinction between learning and training would still be there. The vast majority would learn to solve problems and make themselves useful to society. Learning will remain for learning's sake and for a few who would be able to generate new thoughts and philosophies. However, these students would not find a place of importance in society nor would they be linked to higher education in any traditional way.

Not surprisingly, the skill profile of the teacher would be different from what it is now. The pedagogy would be different too as would be the learning resources like text-books and journals. What is now referred to as the class-room sitting arrangement in flat rooms or sloped galleries would become obsolete. There would be many more institutes of learning and research but physically, these would require much less space.

Traditional publicly funded universities would become obsolete. Institutes of higher education would be funded and controlled by corporations and business houses to ensure that the rapidly evolving new skills are imparted to the best learners who then proceed to work for those corporations. Some scholarly institutions could survive for the deep thinkers and potential philosophers, but without state patronage, they would not exist. In this aspect, the future of a liberal arts education is in question.

The great divide that is likely to emerge in education would imply some interesting changes from the divide of today. Some really talented children who would normally be lost due to economic constraints may be identified and brought into the talent pool. The rest would not have anything to do with the new world of education. Jobs, in the new world would be limited too, since humans would be greatly replaced by machines that can make their own decisions and execute them.

Coming to the job market, where all purposive education leads to, the changes are likely to be remarkably disruptive. A number of things may happen.

**First of all, a large number of jobs will disappear as they will be replaced by machines. Secondly, a set of new jobs with new skill requirements will appear (requiring super-fast learning abilities and extraordinary levels of intelligence).**

People displaced from old jobs may not fit into the new opportunities that open up since their acquired skills have become obsolete. For instance, a bus-driver around 50 years of age, displaced by autonomous vehicles (driverless cars), cannot get a new job as a highly paid computational statistician.

Some will win, while some others will lose. There will be social disruption. A large number of the labour force participants will not only be out of jobs but also unemployable. What society does with this large army of useless people is a trillion-dollar question that will haunt the deep-thinking minority.

The changes described above, one might argue, has been the story of technological change and economic progress throughout history. It has indeed been so.

**However, if the changes we are anticipating happen too fast, as is a possibility, then the disruptions will be large and catastrophic, with labour markets not getting enough time to adapt.**

There are two reasons to believe that this cannot be ruled out entirely. The first is the observed fact that over history newer waves of technological progress have tended to be faster than the previous ones. There is acceleration in progress. The second reason is that the developments in AI are picking up fast and growing into a wave with many changes likely to come together within a short span of time. A research project undertaken by Oxford University studying 702 current occupations in USA, found that about 47 per cent of the US labour force was likely to face displacement from automation in the near future of one or two decades.

A new feature of the disruption is the fact that perhaps for the first time in history professions that were deemed to be requiring more cerebration would also be affected by AI. For instance, lawyers would no longer be required to do the backroom research for a brief. The data from all past cases could be analyzed by a single computer with speed and accuracy, and even arguments generated for use in the trial court.



Hence the need for lawyers will diminish perceptibly. In a similar vein the demand for doctors and medical professionals would come down dramatically with the advent of AI powered devices like IBM's Watson. We have already talked about the impact AI could have on the demand for teachers at all levels of the educational system.

We had said that that our descriptions were based on reasoned speculation.

**Much of what actually happens will depend upon the speed with which the innovative technologies descend upon us.**

The slower the better, but it is likely to be fast. In this context a word about the fortunes of a future business manager. The need for managers in running any business will be much less than what it is now. The role of trainers and coaches with good skills at management tools will increase in demand. The business school of the future will be an interactive workshop for problem solving and learning new skills associated with AI in all its dimensions.

Change is an essential characteristic of social progress and development. We cannot stop the tide. Nor is it desirable. We need to change and adapt so that we may continue to play a socially useful role.

**The only type of person who will surely be needed are the ones who can dream dreams and see visions. A rare species, not always in demand, but priceless valuable. Yet they may become the hapless minority.**

**PROF. RUNA SARKAR**



Runa Sarkar is a Professor with the Economics Group at the Indian Institute of Management Calcutta and a member of committee for Centre for Development and Environment Policy. Prior to this she taught at IIT Kanpur. She is the chairperson of CTran Consulting Services, a leading climate change consulting business in India.

Her interests lie in sustainability where business interests are in consonance with environmental and social interests.



**PROF. ANUP K SINHA**

Dr. Anup Sinha is the former Director of Heritage Business School ('HBS') and currently designated as Chief Mentor. He has also served on the Board of NABARD.

He is a retired Professor of Economics from the Indian Institute of Management Calcutta where he taught for 25 years. He is a popular teacher having won "Best Teacher" awards from alumni and students of IIM Calcutta. He is currently Non-Executive (Independent) Chairman of Bandhan Bank.

# AI in Equity Investing and Portfolio Management Services

BY AKASH GUPTA

Artificial Intelligence has been transforming every sphere of our lives. It reinvents our point of view towards how we analyze huge amounts of data to draw useful insights that drive prudent decision making. One such area where AI has been repainting the global scenario is in Investing and Portfolio Management Services.

Mathematical modelling and complex algorithm based trading strategies have been long used for portfolio management. Perhaps the most notable personality related to the same is hedge fund manager Jim Simons and his company Renaissance Technology's "Medallion Fund". Founded in 1988 by mathematician Jim Simons, the Medallion Fund has generated 62% annualized returns for its investors and has become synonymous with the idea of using mathematical models and algorithms to trade in financial markets.

AI allows portfolio management service providers to create portfolios as per the required rate of return guided by the investment policy statement (IPS) which captures various aspects of an investor's profile such as investment horizon, liquidity requirements and risk tolerance.

**“AI offers a plethora of features, such as data analytics, comprehensive risk assessment, multi-asset allocation, portfolio rebalancing, and performance tracking, for generating alpha and lowering transaction costs.”**

## The Power of AI

### IPS Curation

An investment policy statement (IPS) is a document prepared between an investor/client and the portfolio manager that outlines general rules for the manager. This statement provides the general investment goals and objectives of a client and acts as a guide that offers a structured and objective methodology for prudent investing in the markets.

### Data Driven Findings & Fraud Detection

AI powered tools can handle huge volumes of company-based information from a variety of channels, such as market trends, economic intelligence units, economic indicators, annual reports, earnings calls, investor presentations, and social media. Sharper forecasts can help in better management of risk and in hedging uncertainties.

### Algorithmic trading

High-frequency trading (HFT) algorithms coded and developed by AI enabled systems can exploit real time market arbitrage opportunities and generate abnormal trading profits for the investor within a very short time, sometimes even in fractions of seconds, which are automatically refined and back tested.

### Lower Cost of Transactions

Routine tasks that otherwise are done by personnel and staff can be automated, such as buying and selling of securities as per the Fund mandate, portfolio rebalancing, risk monitoring, generation of portfolio performance reports etc. This leads to lower operational cost and a lower expense ratio for the fund.

## Robo Advisors and Chatbots for Automated Customer Service

AI-ML guided portfolio management portals and services can be accessed at all times of the day and from anywhere, through omnichannels, that provide round the clock real-time updates and notifications. This has allowed the automation of customer service for routine, high volume, and low level work.

### Prudent Risk Management

AI tools have been able to create complex financial products which provide risk pooling advantages by combining various products and sub-products. It empowers investors to strengthen the risk management aspect of the portfolio by superior forecasting and prediction.

### AI in Portfolio Management: Risks Involved

#### Data Training

The power of Artificial Intelligence emanates from the quality of historical data on which it is trained. Some of the data related challenges include being fed an incomplete data set, biased data set, and unavailability of a large data set.

#### Reliability and accuracy

The results can vary according to the degree of assumptions and framing of the holistic model, and exogenous factors and can produce faulty and unexpected outcomes based on the volume and quality of its training data set.

#### Transparency and trust

The models and working of AI are complex and extremely difficult to understand. It is not really a transparent and deterministic model.

## Cost and Security

The cost of implementing a comprehensive AI based platform or solution for portfolio management is substantial and capital intensive. It requires installation of premium grade hardware, software, and a dedicated team for troubleshooting and issue resolution.

### AI in Contemporary Indian Scenario

It is exciting times ahead for the Indian portfolio management space as the nation races towards the target of becoming a USD 5 trillion economy before the financial year 2026-27 and a developed nation by the year 2047. The rise in inflation over the latter half of the past decade has forced Indians to rethink their investment strategy and move away from traditional investment channels of FDs and other safe havens that offer below par returns to equities and bonds.

Retail investor penetration has improved drastically after the Covid pandemic. **The number of demat account holders in India continues to skyrocket, with 11 crore accounts in January 2023, compared to only 8.4 crores as reported in 2022.** Even with these massive figures, it is estimated that only 3% of Indian households are actively investing in stock market.

This signals greater inflow of retail money in the markets in coming years. This sentiment needs to be boosted by a favourable ecosystem represented by simple financial products, low costs of transaction, along with cyber security threat counter mechanisms and accommodating regulatory landscape.



## Akash Gupta

### IIT (ISM) DHANBAD, EX-DELOITTE

Akash is a CFA charter holder, a management consultant by profession and a finance enthusiast with interests in equity research.



# AI's Transformative Impact on Power Distribution Utilities

## A Journey towards Efficiency and Sustainability

BY ASHWINI GAJANAN CHAVAN

In the ever-evolving landscape of technology, few advancements have captured the imagination as profoundly as artificial intelligence (AI). Its far-reaching influence spans across industries, creating innovative pathways for businesses to thrive and society to progress. Among the most promising domains where AI demonstrates its potential is the power and utilities sector. In this article, we delve into the remarkable applications of AI in enhancing service operations within power distribution utilities while simultaneously fostering sustainability.

According to the "State of AI-2022" Survey conducted by McKinsey & Company,

### AI's primary applications lie in optimising service operations.

Among the sectors that are most primed for this transformation, Power Distribution Utilities stand out prominently. This underscores AI's potential to drive efficiency and innovation in the industry.

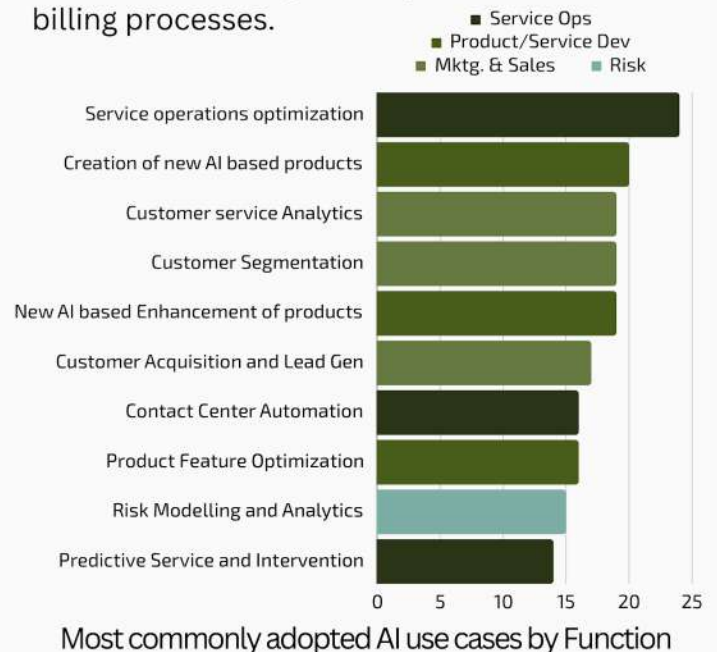
#### Revolutionizing Service Operations

The Ministry of Power in India has embarked on a transformative journey through its Revamped Distribution Sector Scheme, outlining ambitious objectives for the sector's advancement. These include the reduction of pan-India AT&C (Aggregate Technical and Commercial) losses to 12-15% by 2024-25 and the elimination of the ACS-ARR (Average Cost of Supply-Average Revenue Realized) gap within the same timeframe. Additionally, the scheme aims to enhance the quality, reliability, and affordability of power provision while ensuring the financial and operational sustainability of the distribution sector.

Achieving these goals necessitates a deep understanding of consumption patterns, operational efficiency, and customer engagement. Central government finances the majority of the DISCOMs. To gauge the performance of DISCOMs, the government employs Integrated Ratings, where financial sustainability holds a significant weight. This underscores the necessity for an efficient mechanism to capture energy consumption and ensure prompt bill payments. Enter AI-based tools – a crucial enabler for tackling these challenges head-on.

#### From Manual to Automated: AI's Inroads

At the grassroots level, manual entry of energy meter readings into apps or meter reading devices has been common practice. However, the 11th Annual Integrated Rating and Ranking of DISCOMs Report by the Ministry of Power (April 2023) highlights the need for automation and AI-based tools. AI-driven applications can now extract meter data from images, reducing billing errors and enhancing accuracy. This automation not only saves time but also enhances customer satisfaction through transparent and reliable billing processes.



Furthermore, the power distribution sector's frontline employees engage in extensive fieldwork, demanding actionable insights from available data. Relying solely on human analysis consumes valuable time and delays crucial actions on consumer premises. Here, AI steps in as a force multiplier. Leveraging comprehensive monthly and yearly consumer data, AI applications can provide predictive analysis to offer insights into sudden consumption drops or energy non-usage. This facilitates the detection of theft and unaccounted energy units, safeguarding the integrity of the system.

### **AI's Pervasive Reach: Transforming Revenue Generation**

Certain high-load consumers operate under Time of Day (TOD) tariffs, equipped with automatic energy meters. These meters provide a wealth of data, which, when integrated with AI systems, allows for the analysis of critical information. The AI-based approach enables prompt identification of energy unit losses and empowers DISCOMs to monitor high-revenue-generating consumers more effectively. Given that these consumers contribute to a significant portion of revenue (80%), the impact on the bottom line is substantial.

### **Predictive Insights for Operational Excellence**

DISCOMs possess historical data on power interruptions across feeders, a goldmine of information AI can unlock. Employing AI-based predictive analysis on this data assists in materials planning, resource allocation, maintenance prioritisation, and scheduling. By minimising distribution losses and optimising resource utilisation, AI transforms maintenance from reactive to proactive.

### **Stitching together Fragmented Data**

In an era marked by data-driven decision-making, the integration of fragmented data silos becomes paramount. DISCOMs often grapple with disjointed information on payment history, consumption patterns, registered theft cases, and customer complaints. AI systems bridge these gaps, establishing logical connections that provide a holistic view. This integration empowers DISCOMs to make informed decisions, personalise customer interactions, and streamline operations efficiently.

### **Paving the Way Forward**

As the power and utilities sector sets its sights on the future, AI emerges as an indispensable tool to achieve the central government's objectives of financial sustainability and operational efficiency. Collaborative efforts between government bodies, utility companies, technology providers, and consumers are key to fostering responsible AI integration. Clear regulatory frameworks and data privacy guidelines ensure that AI is harnessed for the greater good while safeguarding consumer rights.

In conclusion, the profound impact of AI on the power distribution utilities sector reverberates through every aspect of its operations. From demand forecasting to renewable energy integration, maintenance, and customer engagement, AI paves the way for a sustainable, efficient, and customer-centric industry. The journey towards harnessing AI's potential is a transformational one, shaping a future where power distribution becomes not only a technological achievement but also a sustainable cornerstone of societal progress.



## **Ashwini Gajanan Chavan**

**VNIT, EX-MSEDCL, EX-L&T**

Ashwini is a power sector professional with deep ground level insights of the Industry. She is marketing enthusiast and a passionate dancer.



# How AI is empowering CDPs to drive the Consumer Experience

**BY NISHANT GAURAV**

Could you envision a day without coming across AI? Its all-encompassing existence has effortlessly assimilated into every aspect of our lives.

**Among the innovative technologies, the AI-driven Customer Data Platform (CDP) has emerged prominently, serving as a potent instrument that is transforming the way enterprises comprehend, interact with, and bring contentment to their customers.**

AI/ML are dynamically changing Customer Data Platform (CDP) analytics by enabling these technologies to access multiple data points, across departmental silos, resulting in a more accurate customer profile and the ability to provide real-time decisioning. This article explores how AI-driven CDPs elevate the customer experience throughout every step of their journey.

## **Evolution of CDP**

Gartner's recent report, the Market Guide for Customer Data Platforms, defines a CDP as being used for "centralizing data collection, unifying customer profiles from disparate sources, creating and managing segments, and activating those segments in priority channels." A CDP is useful to marketers, sales teams, customer service agents, and other customer facing business functions.

Given that customer data is spread across all of a brand's channels, as well as hidden away in data silos in various departments, in disparate software platforms, the number one function of a CDP is to unify all of that data in one location. Additionally, a CDP facilitates the creation of customer segments, however it goes further than that and enables the hyper-segmentation of customers.

It enables a brand to target very specific groups of customers, and also allows the brand to exclude or suppress other specific groups of customers who, for example, are not likely to be interested in what the brand is offering. For instance, there may be a specific group of customers who are between the ages of 20 and 35 who are Mumbai Indians' fans and live in the Mumbai area – but targeting males in that group with ads for female-oriented products might not be as effective as targeting the females in the same group.

## **Real-Time Decisioning**

To be able to recommend the next best action requires the most recent, up-to-date data, which is simply not possible without a platform which unifies the latest customer data from across channels, in real-time. Take customer churn as an example. If marketing is relying on business intelligence teams or data scientists to collect data from disparate systems, run predictive models, and create segments of customers based on their propensity to churn, the data could be weeks or even months old by the time it's ready for use. These kinds of operational inefficiencies can have a big impact on short-term marketing goals and long-term business profitability.

Real-time decisioning in a CDP is critical with consumer behaviours changing, as they now expect a brand to know them in real-time, across multistage and multichannel journeys. The key is to have all of the data current, precise and available for use in the cadence of the customer. By perfecting data in real-time at the point of ingestion – cleansing, matching and integrating it in a way that is fit for purpose – brands are in a much better position to deliver compelling and differentiated customer experiences.

## Hyper-Personalization

Not only is it more important to provide personalized content today, it must be presented based on the customers' current state. An AI-based CDP allows a brand to adjust its marketing efforts to the current context of its customers through customer segmentation and real-time decisioning. Because a CDP utilizes first-party data which comes from customers that have purchased from or opted-in to a brand, a holistic view of each customer is developed based on their preferences, past history and current real-time behaviour. One of the biggest challenges to personalization at scale is having access to an actionable single customer view. A CDP collects and consolidates customer data from across systems and sources to create the most comprehensive and up-to-date record of what you know about your customers – including online, offline, behavioural, interest-based, and synthetic attributes.

To deliver comprehensive, multi-channel, multi-touch journeys which meet the needs and expectations of individual customers, brands are finding that an AI-based CDP is able to guide such an experience amid growing complexity. To do this, there is a growing recognition that an accurate, personalized and real-time customer profile is essential for driving decisions across multiple channels at the cadence of the customer.

**An AI-based CDP can facilitate the collection, unification, cleaning, and standardization of customer data from across all of a brand's channels, all of which enables the CDP to create hyper-segmented customer profiles. AI enables real-time decisioning based on current customer data, which facilitates the hyper-personalization that customers expect today.**

## How Can AI-Based CDPs Improve the Customer Experience?

With this deeper understanding of customers, brands are able to use actionable intelligence to create highly personalized experiences that resonate with customers. Additionally, AI and ML can be leveraged for more precise customer segmentation, as well as to predict which customers are least likely to be retained. This understanding enables brands to proactively take action to keep the customer within the sales funnel until they become a customer. With an AI-based CDP, brands are able to follow customers as they progress through their journey, and can minimize or eliminate any pain points before they become a problem.

A brand's customer experience initiative should drive their CDP strategy, as the ultimate purpose for having an AI-based CDP is to improve and enhance the entire customer journey across all of the brand's channels. When they are deployed in line with the customer experience and business operations, AI and machine learning are essential to advance toward a market of one – highly personalized messages, offers and content in the context of each customer journey. While it is impossible to make the necessary decisions and next best actions to scale at a purely human level, AI/ML empowers marketers to get to highly granular segmentation and predictive models that are tunable to meeting their priority business objectives.



## Nishant Gaurav

VIT, EX-NAGARRO, EX-SAPIENT, EX-INFOSYS

Nishant is an IT professional with a keen understanding of industry dynamics. He revels in exploring new territories through photography.



# Celestial Pathways – AI's role in Orbital Safety

**BY HARSH TRIVEDI**

## Introduction

Earth orbits have become increasingly congested with satellites, debris, and other objects, leading to growing concerns about the safety of space operations and potential collisions. According to Space Surveillance & Tracking (SST) report published by Frost & Sullivan (2022), there are more than 130 million space objects between the size 1 mm to 1 cm in size. These debris can orbit the earth for decades, if not centuries, and hence posit a huge threat to the space ecosystem.

Scientists and engineers are exploring Artificial Intelligence (AI) technology to transform space surveillance tracking to overcome these difficulties. AI has the potential to significantly increase our understanding of space dynamics and our capacity to detect and manage objects in orbit by processing enormous volumes of data, identifying patterns, and making predictions in real-time.

## The Challenge of Space Surveillance Tracking

The expanding deployment of satellites for communication, navigation, Earth observation, and scientific research has brought numerous benefits to humanity. However, this proliferation has also led to a crowded and complex environment in space. Race between Starlink (12,000 satellites), Kuiper (Amazon, ~3200 satellites) and OneWeb to provide low-cost, high-speed internet by leveraging large constellations of small satellites is also exponentially increasing the need for effective object tracking.

The tracking of these satellites, along with space debris resulting from defunct spacecraft and collision fragments, is crucial

to avoiding collisions and maintaining the integrity of space infrastructure.

Ground-based radars and telescopes are used in traditional space surveillance technologies to track and predict the paths of objects in orbit. While these methods are useful to some extent, they are constrained by factors such as weather, visibility, data amount, and so on. This is where AI technology can help to transform how we track objects and satellites in space.

## AI-Powered Space Surveillance

Artificial intelligence offers a range of tools and techniques that can significantly enhance space surveillance tracking. Here's how AI is making its mark in this domain:

**Data Processing and Analysis:** AI algorithms are adept at processing vast amounts of data quickly and accurately. In space surveillance, this capability enables real-time monitoring and analysis of objects' positions, velocities, and potential collision risks. AI can sift through complex data sets, identify relevant information, and provide actionable insights to operators.

**Pattern Recognition:** AI excels in identifying patterns and anomalies in data. This ability is crucial for detecting changes in an object's behaviour, such as deviations from predicted trajectories, which could indicate potential collisions or malicious activities.

**Predictive Modelling:** Machine learning algorithms can analyse historical data to create predictive models that forecast the future positions and trajectories of space objects. This helps operators plan orbital adjustments and collision avoidance manoeuvres well in advance.



**Automated Decision-Making:** AI systems can automate decision-making processes, allowing for faster responses to dynamic situations. When AI detects a potential collision risk, it can trigger alerts and even propose mitigation strategies, reducing the human response time and minimizing the chances of a collision.

**Collaborative Space Traffic Management:** AI-powered systems can facilitate information sharing and collaboration between different space agencies and organizations. By aggregating data from various sources and applying advanced algorithms, AI can help create a comprehensive picture of the space environment and enable more effective traffic management.

### Challenges and Considerations

While the potential benefits of integrating AI technology into space surveillance are significant, there are challenges to address:

**Responsible AI:** Principles of Responsible AI must be reflected every step of the way. A system that is not fair, transparent, explainable, and robust cannot be put into operation, since the societal costs far outweigh the technological benefits.

**Geopolitical Complications:** Since space is a common frontier, establishing and enforcing common laws, regulations and practices will require substantial efforts from all global and business leaders. National security concerns will also need to be carefully considered.

**Data Quality:** AI models heavily depend on accurate and up-to-date data. Ensuring the reliability and accuracy of the data used for training and inference is crucial to avoiding incorrect predictions.

**Ethical and Security Concerns:** AI systems in space surveillance must be designed with security and ethical considerations in mind. Unauthorized access to AI-powered space surveillance systems could potentially lead to misuse or tampering with critical data.

### Conclusion

As humanity's presence in space continues to expand, the need for efficient and advanced space surveillance becomes paramount. AI presents an attractive answer to the issues posed by growing congestion in Earth's orbit. AI-powered space surveillance has the potential to increase our understanding of space dynamics and our ability to identify and manoeuvre objects in orbit through data processing, pattern identification, predictive modelling, and automated decision-making.

While there are challenges to overcome, the benefits of adopting AI into space surveillance are clear: **a safer and more secure space environment for current and future generations.**



**Harsh Trivedi**  
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# AI in the Circular Economy: Transforming Sustainability Strategies

BY JINESH PATEL

*A regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing, and narrowing energy and material loops –* Circular Economy as defined by the Ellen MacArthur Foundation. This visionary concept has emerged as a transformative force in sustainable business, promising not only environmental and social benefits but also a staggering net economic gain of €1.8 trillion by 2030 in Europe alone. However, realizing the full potential of circular principles faces numerous challenges. Fortunately, there's a technological ally on the horizon – Artificial Intelligence (AI) – ready to drive progress and unlock boundless possibilities.

## Revolutionizing Supply Chain Dynamics

At the core of any successful circular economy strategy lies an optimised and adaptable supply chain. AI's standout capability lies in its power to transform supply chain operations. By analysing vast datasets, AI empowers organisations to streamline supply chains, reducing resource consumption and waste. This translates into enhanced sustainability, cost-efficiency, and resilience. Predictive analytics and machine learning algorithms enable businesses to forecast demand with unprecedented precision, enabling agile inventory management and slashing transportation emissions. Early adopters of AI-enabled supply-chain management have witnessed remarkable improvements: logistics costs reduced by 15%, inventory levels cut by 35%, and service levels boosted by 65%, leaving competitors in the dust.

AI-enabled real-time monitoring and tracking enhance transparency and accountability across all aspects of the supply chain, which are critical components of achieving circularity.

## Influencing Consumer Behaviour through Personalization

Consumer choices wield immense influence in shaping the success of circular economy initiatives. AI-powered recommendation systems, akin to those familiar with e-commerce platforms, have the potential to reshape consumer behaviour. These systems scrutinise consumer behaviour and preferences. By tailoring product recommendations to align with circular principles, AI nudges consumers towards opting for recycled or refurbished goods, extending the lifespan of their possessions, and making eco-conscious choices. Moreover, AI-derived behavioural insights are invaluable for devising marketing strategies and campaigns that promote circular consumption.

## The Recycling Revolution with AI

Efficient waste sorting and recycling are central to the circular economy transition. Conventional waste management systems often fall short, leading to contamination and material losses.

AI-equipped machines, armed with cameras and sensors, possess the precision to identify and segregate recyclable materials from mixed waste streams with unmatched accuracy. These robotic sorters tirelessly work at rates unattainable by human labour, boosting recycling efficiency and reducing reliance on virgin resources. A World Economic Forum study found that AI could increase global recycling rates by up to 50%.

Overall, by incorporating AI into the recycling process, we can significantly improve recycling rates, reduce the cost of recycling, and decrease greenhouse gas emissions. This is a win-win for the environment and the economy.

*AI could eliminate 1.8 billion tons of greenhouse gas emissions per year by 2050, as per a study by the Ellen MacArthur Foundation.*

### **Generative AI for Circular Design**

In the circular economy paradigm, product design and material choices are paramount. AI takes centre stage in this domain, particularly in the realm of generative design.

**Generative design, a specific AI application, creates optimised product designs that minimise material use and waste by up to 20% - McKinsey & Company.** It explores countless design possibilities based on defined criteria. This versatile technology applies across industries, facilitating the development of products that embody circular economy principles.

For instance, *Nike employs generative AI to design shoes* that are easier to disassemble and recycle. The company's AI-powered design platform considers factors such as material selection, construction methods, and end-of-life options when generating new designs.

Generative AI is a powerful tool that helps designers create more sustainable and circular products. As AI technology advances, we can expect generative design to play an increasingly vital role in the circular economy.

### **AI-Powered Metrics for Circular Impact Assessment**

Accurately measuring the impact of circular initiatives remains a critical challenge. How can we comprehensively assess the environmental, economic, and social effects of circular practices? AI steps into this arena

offering its robust analytical capabilities.

AI delves into vast datasets from diverse sources to provide a comprehensive view of the impacts of circular practices, encompassing reductions in carbon emissions, resource conservation, job creation, and community development.

Furthermore, AI-powered impact assessment tools enhance transparency and accountability. They empower organizations to communicate their circular achievements effectively, fostering stakeholder trust and support for sustainable initiatives. In essence, AI bridges the gap between aspiration and actuality by delivering concrete data on the tangible benefits of the circular economy.

### **Conclusion**

The circular economy is not just a vision but a strategic pathway towards a sustainable future. It offers an opportunity to simultaneously reduce environmental impact and drive economic growth. The synergy between AI and circular economy principles is poised to be a game-changer in achieving these objectives.

From optimising supply chains and shaping consumer choices to automating recycling processes and guiding material innovation, AI-backed capabilities provide practical solutions to advance circular economy strategies. Moreover, AI's role in measuring and monitoring circularity progress ensures transparency and accountability, reinforcing your commitment to sustainable practices.

***Integrating AI into sustainability and business strategies is no longer an option but a strategic imperative, promising a brighter, more sustainable future for all.***



## **Jinesh Patel**

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Jinesh is an Energy Sector Professional committed to advancing the decarbonization of energy and transportation sectors, alongside promoting the development of the circular and hydrogen economies.



# Embracing the Destiny: AI's Effect on Infrastructure Industry

BY D VISHWATEJA ASHISH

## Introduction

The infrastructure sector is presently undergoing a significant disruption owing to the swift and substantial progress in artificial intelligence (AI) technology. AI is transforming industries encompassing transportation, power, construction, and telecommunications, propelling them towards a future marked by unparalleled growth and untapped possibilities.

In this article, we will delve deeper into how AI transforms various fields within infrastructure industries, paving the way for more innovative, more efficient, and sustainable systems.

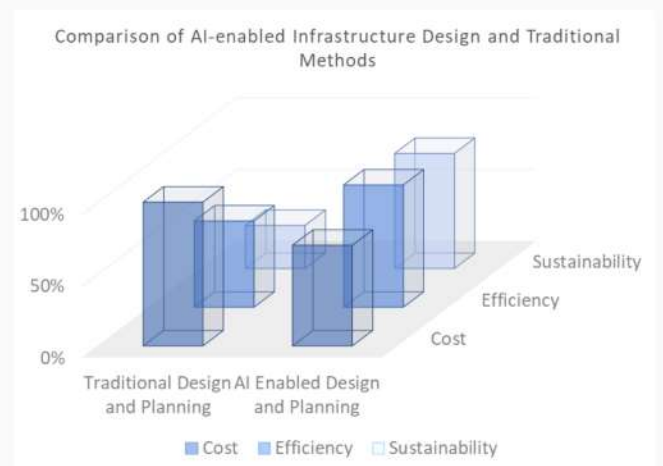
## Optimised Layout and Planning

AI optimises infrastructure design and planning by improving resource allocation, reducing costs, and minimising environmental impact. By analysing vast amounts of data, including past projects, ecological conditions, and stakeholder needs, AI algorithms generate optimised designs prioritising cost, efficiency, and sustainability. This promotes environmentally friendly infrastructure growth by reducing adverse effects.

By processing and analysing large datasets, AI provides informed insights for improved design decisions. An analysis shows the practical benefits of AI-driven optimisation. Exhibit followed illustrates remarkable efficiency and cost savings improvements from AI optimisation versus traditional methods - a 20% decrease in construction costs and 15% shorter project duration.

These results demonstrate AI's considerable potential to enhance infrastructure planning and design through superior resource allocation, reduced costs, shortened

timelines, and sustainable outcomes. AI empowers data-driven decision-making for more efficient, cost-effective, and eco-friendly infrastructure development.



## Intelligent Project Management

AI-powered project management tools are revolutionising construction by streamlining processes and improving project delivery. These systems use AI algorithms to analyse timelines, resource allocation, and risks. By providing crucial insights, they enable data-driven decision-making and prompt action when needed.

Anomaly detection algorithms act as watchdogs, monitoring parameters and alerting managers to deviations from the plan. This proactive approach allows swift issue resolution, risk reduction, and disruption prevention before escalation.

By seamlessly integrating technology and project management, AI solutions enhance collaboration, boost productivity, and drive better outcomes. The potential for ongoing innovation and advancement in project management techniques becomes limitless as AI develops. AI empowers optimised, insight-driven project management for a more efficient, productive construction sector.

## Predictive Maintenance and Asset Management

AI-driven predictive maintenance is transforming infrastructure asset management. AI systems integrate IoT and sensors to collect real-time data on asset conditions, performance, and usage. Using advanced analytics, AI can predict maintenance needs, detect potential faults, and optimise asset lifecycles.

AI enables proactive maintenance, minimising downtime and prolonging critical infrastructure assets' lifespan by identifying signs of wear, degradation, or anomalies. This enhances safety, reduces maintenance costs, and improves overall infrastructure performance and reliability compared to traditional methods.

A compelling graph demonstrates the significant improvements from implementing AI-based predictive maintenance solutions - substantial declines in maintenance expenses and downtime, plus extended asset lifespan versus conventional maintenance, AI-powered systems deliver 30% lower maintenance costs, 20% less downtime, and 15% longer asset lifespan. These results showcase AI's transformative potential to revolutionize asset performance and reliability through data-driven predictive insights. AI empowers smarter, more efficient infrastructure asset management.



## Intelligent Infrastructure Monitoring and the Future of AI in Construction and Real Estate

In construction, AI investments in robotics, drones, and intelligent cameras transform operations. Automation and robotics enhance precision and productivity on sites by reducing human intervention. AI-equipped drones provide efficient mapping, monitoring, and surveying, delivering insights while minimising manual labour. Intelligent cameras with computer vision track activities and ensure regulatory compliance.

By embracing these AI technologies, construction gains significant benefits - economised costs, refined tracking, faster deadlines, and improved safety and quality. AI empowers precise, efficient, compliant, high-quality infrastructure monitoring, construction, and real estate development. It brings groundbreaking changes to these interconnected industries through automation, data insights, and cutting-edge capabilities.

## AI implementation in infrastructure industries in India

AI is transforming India's infrastructure industries. Companies like Larsen & Toubro and Shapoorji Pallonji Group are using AI to enhance operations and innovate. AI delivers many benefits, including improved efficiency, safety, resource optimisation, and customer satisfaction.

Continued AI advancements promise increased productivity, sustainability, and well-being. With AI, infrastructure development will thrive on digital connectivity and data-driven insights. AI empowers the construction sector to help drive the nation forward.



## D Vishwateja Ashish

### PMP, EX- NHAI, M.TECH

Vishwa is an adept infrastructure manager, optimizing bottom lines through leading transformative projects and implementing sustainable solutions to complex operational problems.



# Unleashing AI in Pharma and Healthcare

BY SHUBHANKAR BHARDWAJ & PRAKASH BHARATI

AI has transformed medical image assessments, providing quick results in minutes compared to hours manually. Fueled by efforts from organizations like OpenAI and Google, coupled with widespread cloud computing adoption and data standardization, AI's evolution spans industries. Leveraging terabytes of data, organizations innovate with AI not only for value creation but also social impact. This article explores real-life AI applications in Healthcare and Pharmaceuticals, utilizing techniques like Large Language Models, Computer Vision, Convolutional Neural Networks, Generative Adversarial Networks, and Robotics. Many of these applications are in the Proof-of-Concept phase or undergoing small-scale implementation, promising to enhance patient care and organizational value.

## **Post-Procedure Patient Monitoring:**

To enhance post-treatment patient follow-ups efficiently, a two-pronged approach leveraging recent advancements is proposed. Recent developments in Large Language Models (LLM) and Speech Models, such as Google LaMDA, enable AI to engage in real-time conversations with patients, resembling human interaction. Specifically trained LLM-based AI models interact with patients, notifying doctors only when patients report post-procedure symptoms, optimizing response efficiency. The resulting data is automatically collected, stored, and displayed on dashboards, ensuring seamless access for healthcare providers to patient interactions.

Simultaneously, the solution incorporates the use of Internet of Things (IoT) devices for remote patient monitoring, addressing resource constraints.

TempTraq, a Bluetooth-enabled sticker, tracks post-procedure temperature fluctuations, aiding patients who undergo treatments like chemotherapy. This data is uploaded to the cloud via Bluetooth and phone internet, allowing doctors remote access for observation. Another IoT device, the Insulin Patch called V-Go, administers insulin and monitors sugar levels for diabetic patients. Beyond immediate benefits, the collected data serves as a foundation for predictive models, anticipating health patterns and reactions, thereby advancing proactive patient care.

By seamlessly integrating AI-driven patient communication and IoT-enabled remote monitoring, this comprehensive solution not only enhances the efficiency of post-treatment follow-ups but also contributes to a more proactive and data-driven approach in healthcare, ultimately improving patient outcomes.

## **Accelerated Drug Discovery:**

The conventional drug discovery and development process, spanning a decade, involves identifying thousands of compounds, followed by toxicity screenings and efficacy tests. AI is poised to revolutionize this lengthy journey, significantly reducing time from discovery to market approvals.

**AI generation models like ADQN-FBDD and APEX-FBDD analyze vast biological datasets to virtually create and test compounds, expediting the identification of potential drug targets.**

An example of such includes Atomwise, utilizes AI to screen millions of compounds rapidly, enhancing the efficiency of identifying promising drug candidates. Insilico Medicine employs AI to analyze protein structures, identifying new drug targets for diseases like cancer, Alzheimer's, and HIV.

In parallel, LLM-based AI models and IoT devices streamline clinical trials by tracking patients, ensuring compliance, and monitoring adverse events. As personalized treatments like CAR-T Cell Therapy gain prominence, AI becomes integral to commercializing such drugs. GlaxoSmithKline collaborates with IBM Watson to analyze patient genetic data for personalized cancer treatments, exemplifying AI's role in tailoring effective drugs.

The transformative impact of AI extends beyond drug discovery, encompassing patient-centric applications. By leveraging AI, healthcare organizations enhance clinical trial monitoring, ensuring patient safety and compliance. As the industry pivots toward personalized treatments, AI-driven platforms contribute significantly to individualized drug development.

In conclusion, AI's multifaceted role spans from expediting drug discovery and development to optimizing patient-centric applications. This transformative technology not only accelerates the identification of potential drug candidates but also contributes to a more personalized and efficient healthcare landscape.



### **Digitizing Health Records:**

In developing countries like India and even in digitized healthcare systems, data standardization challenges hinder interoperability. AI solutions like the Health Data Engine automate the conversion of existing data to the latest health standards, enhancing integration.

### **Tools like DocAI are explicitly trained on physical health records, scanning and converting documents into accessible data formats.**

DICOM images, aiding AI models, accelerate diagnosis for pathologists, providing image analyses and prognosis recommendations for doctors. These AI applications address the hurdles of disparate data formats and manual conversion in healthcare records, paving the way for a more integrated and efficient digital ecosystem.



## **Shubhankar Bhardwaj**

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Shubhankar is a Consultant with experience in improving patient care and making next gen personalized therapeutic treatment accessible.



## **Prakash Bharati**

**EX-LILLY, EX-ZS**

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# AI in Automotive Industry

BY ANKUR AGARWAL & ARUNESH YADAV

When you think of Artificial Intelligence, does the "Automotive Industry" immediately spring to mind?

It is for sure, No. It is AI chatbots such as ChatGPT, Microsoft Bing Chat, or Google Bard because these are the most visible applications of AI that we are used to.

So, how relevant is Artificial Intelligence for the automotive industry?

Since AI as a technology disruptor and today's buzzword belongs to Industrial Revolution 4.0, let's roll back the discussion and first explore the impact of different industrial revolutions on automotive industry.

Automotive Industry has been a beneficiary of almost all the industrial revolutions.

While the automotive industry did not exist during the first Industrial revolution 1.0, the advancements and transformations brought about during this period through mechanization of production laid the groundwork for the development of the automobile industry later on.

First automobile saw light during Industrial revolution 2.0 with invention & development of internal combustion engine, electrification of factories and concept of mass production popularized by Henry Ford through assembly line techniques, leading to higher production rates and significantly lower costs.

Industrial revolution 3.0 furthered the development of automotive industry through automation of production.

What we are witnessing as Industrial revolution 4.0 in today's times is making automobile industry "smarter" in a considerable manner.

While Technologies such as the Internet of Things, Artificial Intelligence, Big Data, Cloud, and Cyber-physical systems are leaving a profound impact, Artificial Intelligence (AI) is making a significant impact on the automotive industry, revolutionizing various aspects of vehicle development, manufacturing, driving, and customer experience.

Could you imagine yourself, a decade ago, sitting at the back seat of car with no driver in driving seat and your car taking you safely to your destination on its own?

It would have looked like a dream or so but, thanks to AI, this is turning into reality.

However, AI in the automotive industry is not only changing the vehicles on the road, making them safer but the factories that produce them.



Scan the QR code on the left to see how AI is impacting across the automotive value chain.

Let's take a look at automotive value chain to understand how AI is transforming the industry:

## #1 Manufacturing:

With the inclusion of Industry X and AI, manufacturing technologies have shifted to digital manufacturing. AI is revolutionizing the factories building intelligent cars. Companies like ABB, Rockwell Automation, and FANUC Robotics are integrating AI in their offerings to improve the welding, painting, assembly, and quality check processes.



## #2 Design

Designing and development of cars has become much easier and faster. Feeding AI the vast amount of data collected from customers and markets has made customization of car design easier. This has ultimately reduced the time-to-market of new models and the costs.

Moreover, AI-powered simulations play a crucial role in assessing a vehicle's performance under various conditions, ensuring the safety and reliability of every model.

## #3 Driver Assistance

Heard of ADAS – Advanced Driver Assistance System. AI is behind the ADAS, which helps in collision detection, adaptive cruise control, lane departure, and blind spot control in new-gen vehicles.

AI is also integrated into the infotainment systems offered by OEMs. Customizing the driving experience, music, and other media offerings based on customer moods are a few avenues for AI research.



### Future of AI in Automotive industry:

AI is expected to play an even more prominent role in shaping the future of the automotive sector as new technologies and applications continue to emerge.

#### 1. Vehicle to everything communication.

AI-powered V2X communication will enable vehicles to interact with other vehicles, infrastructure, and pedestrians, providing real-time information and improving overall traffic safety and efficiency.

#### 2. Enhanced cybersecurity.

As vehicles become more connected and reliant on software, the importance of robust cybersecurity measures will increase. AI-driven security solutions can help protect vehicles from cyber threats, ensuring the safety and privacy of users.

#### 3. AI-enabled manufacturing.

Using AI in automotive manufacturing can increase efficiency, reduce waste, and improve product quality. Examples are AI-powered automation, and quality control.



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Arunesh is an Automobile expert with understanding of Process Design and Digital Transformation. He loves finding out the answers to the WHY's around day to day stuff.





# AI in Manufacturing

## AN INSIDER VIEW

**By Mr. Durga Madhaba Padhy & Mr. Amol Shrikant Kulkarni - MBAEx Class of 2020**

### Introduction

*“The earth furnishes the means of wealth; but wealth itself cannot possibly have any existence, unless through industry and labor which modifies, divides, connects, and combines the various productions of the soil, so as to render them fit for consumption” - Adam Smith.*

Stylisations in economic development of developed and more importantly developing nations highlight the pivotal role of manufacturing as an economic activity for economic prosperity. Manufacturing growth is directly linked to increasing wages and prosperity in societies. But not every economy has risen the prosperity ladder through manufacturing due to various reasons including trade barriers, lack of suitable infrastructure, automation replacing workers, rising costs and technological advancement among many. Developing economies manufactured goods at a competitive cost mainly due to labor arbitrage and after a period this arbitrage opportunity gets offset once wages start to rise or arbitrage margin reduces due to technological advancements that allows firms to produce more with less resources.

Among the many technological advancements, Automation through either simulated processes or machine intelligence has had a profound impact so much as to bring down manufacturing cost in developed economies.

So it became imperative for all to adopt AI in manufacturing to remain competitive.

### History & Importance of AI in Manufacturing

The inaugural use of AI in manufacturing can be traced to the 1970s, which saw the advent of discrete manufacturing using computer-assisted design (CAD) and computer numerical control (CNC) machines. Over the years, CAD and CNC incorporated advanced algorithms etc. to improve accuracy and optimize performance. By the 1980s and 1990s, manufacturers' focus shifted to systems and applications that capture data and provide high level insights. These inventions made real-time data collection and data transmission faster and easier while streamlining production through automation.

The advancements in automations have become the backbone of AI implementation. Automation technologies integrated with AI applications will help organizations to :

- Optimize operations and increase efficiency
- Predict machine failure and reduce machine downtime
- Reduce supply chain risks
- Predict sales volume for better capacity planning
- Improve the quality of products.

Advent of AI is eventually enabling organizations to monetize features such as predictive maintenance, real time monitoring in the form of service offerings or as quality assurance packages.

While the potential for AI in manufacturing is significant, actual adoption falls behind the hype due to various reasons such as

- Lack of good quality data
- Weak business case in terms of Return on Investment
- Challenging change management
- Lack of technical skills and competencies for sustained use of technology
- Focus on technology rather than Value
- Lack of proper digital strategy and governance for manufacturing

Despite the hurdles, organizations have started innovating for AI in manufacturing in a decentralized manner to avoid risks of investing too early into unproven use cases. So, at first organizations start with limited use (Proof of Concepts- POC) of AI technology in identified use cases without a clear vision. Upon successful completion of POCs, AI solutions are scaled, leading to wider adoption across value chain.

We have documented our experiences through AI implementation in use cases that demonstrate successful cost optimization. These cases serve as practical guidelines for achieving success and avoiding pitfalls when implementing AI solutions in manufacturing operations.

### **Use Case 1 - Predictive Quality**

The initial use case we encountered as consultants for a manufacturing firm revolved around the combined objective of maximizing quality and optimizing resources.

#### **Problem Statement:**

A cement manufacturing firm wanted to improve their efficiency in terms of quality control and resource utilization in the manufacturing process. They were experiencing erratic quality control (due to hourly random -

-sampling for quality control), inefficient power consumption (which consists of ~20-30% of total cost) in manufacturing compared to their peers, and people driven quality control due to human judgment-based interventions. The core problem was a lack of awareness about the correct quality control intervention.

To address the challenge, we envisioned obtaining real-time insights into anticipated quality. We considered using machine parameters to guide corrective actions. As a solution, real-time data on the manufacturing process and operating parameters, driven by machine learning algorithm, were employed to predict output quality. The predicted quality served as a trigger for the automated quality control system, allowing it to implement corrective actions by managing manufacturing conditions and balancing processing time and intensity.

To monitor performance of the implemented solution, quality predictions were benchmarked with actual quality daily. Regular weekly huddles were conducted to ensure consistency in decision-making regarding changes in operating conditions. From IT side, end to end machine learning operation loop was set up for -

- Failure Prediction
- Corrective Action
- Performance Monitoring
- Deviation Analysis
- Re-Training of Models
- End to End Dashboarding

The practice of Machine Learning operations played a crucial role in proactively addressing issues, and incremental learnings facilitated adaptation to evolving manufacturing conditions and inputs.

#### **What we Achieved out of this?**

- Achieved stable and predictable output quality, resulting in reduced re-processing time.
- Realized a 30% reduction in power costs.
- Attained a 5% increase in throughput.

Things that stood out well for us:

- Emphasis on Machine Learning operations as a practice
- Utilization of in-house capabilities to enhance Return on Investment (ROI)
- Possession of a digitally proficient manufacturing team
- Establishment of a Project Governance Board post a successful Proof of Concept (POC)

What to look out for to succeed :

- Continuous monitoring of performance
- Continuous learning and adjustment, including re-training of models
- Customer centric approach to modeling

### **Use Case 2 : Golden Batch Analytics for a Life Sciences Company**

In the second use case, we implemented an analytics solution to improve Batch Quality, which was critical for profitability and Quality compliance, for a Life Sciences Company. The batch with best output yield is called as Golden Batch.

#### **Problem Statement:**

The cost of deviations in batch quality can cost up to 5% of the revenue per batch depending on the nature of product. The sole method to analyze historical and time-series data for exploring batch deviations required experts to spend a significant amount of time manually reviewing batch data. Significant time was spent in Data extraction, visualization, and plotting to create process parameter profiles with the objective to reduce process variability and increasing yield. However, this manual approach became increasingly inadequate for precisely identifying relationships, batch process conditions, and batch output quality. The current method had two key issues:

- Golden batch profiles require many hours to be spent manually
- Three-way data (Batch Process Parameters, Batch Process Conditions and Batch Output Quality) makes it hard to optimize process inputs to manage batch yield

Action taken was two step approach

- Applying advanced analytics algorithms to identify Critical Process Parameters (CPP)
- Finding golden operating conditions of each CPP for maximum yield and conditions that of CPP that can cause Lower Yield.

#### **Achievement**

We increased yield and revenue with minimal or no added costs. Depending on the product, maintaining golden batch conditions can yield benefits of 5-10% of batch revenue. The impact was so profound that the Head of Manufacturing and CIO formed a joint team to implement the practice across the product portfolio because it helped immense potential during the economic downturn.

Companies hardly invest in new technology during severe economic downturn unless they are cash rich. But this investing approach was contrary to usual practice because

- Business case was in line with strategic long-term initiatives.
- Established process maturity and high level of digitization ensured good data quality.
- Digital First Culture and strong governance framework.

#### **Strategic Framework for AI Adoption in Manufacturing**

Leveraging our experience, we have developed a strategic framework to help stakeholders in assessing business cases and making informed decisions on AI investments. This framework plots use cases based on business value and complexity, facilitating strategic discussions for manufacturing stakeholders.

The framework features 4 quadrants based on proximity to business value and complexity axes:

**High Reward Wins:** These are “low hanging apples”. Organizations can prioritize this -

quadrant for its high ROI with low implementation complexity.

**Strategic Initiatives:** Use cases in this quadrant are typically strategic and long-term with high business value. However, the complexity of implementation is also high as these projects are executed over a span of 2-3 years.

**Marginal Wins:** These use cases offer minimal ROI, often occurring in nascent technology stages with high implementation costs. GenAI in manufacturing falls in this category for now, but it is expected to transition to High Reward Wins as technology matures and business outcome is well defined.

**Exceptional Initiatives:** These are short-lived initiatives typically tied to emergency situations, such as real-time monitoring of damaged equipment at a plant or in exceptional situations such as using robots in hazardous situations.

In mapping the use cases, stakeholders can consider parameters influencing business value and implementation complexity.

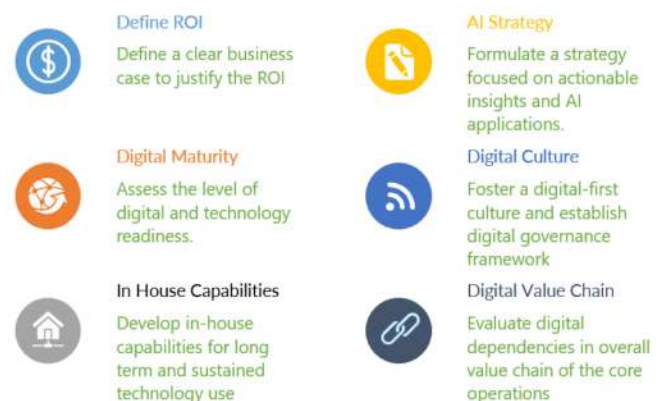
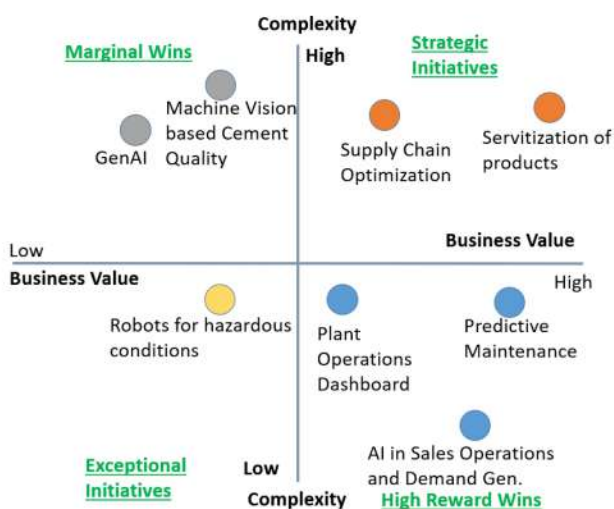
Business Value is often gauged using below parameters:

- Cost Optimization
- Revenue Maximization
- Risk Management
- Product Lifecycle Improvement

Complexity is determined by these parameters:

- Digital Readiness - IoTization of plants and systems
- Internal Readiness/In-House Capabilities - CIO Org. capabilities, Technology Infrastructure
- External Readiness - AI development partners, Supply chain dependencies

For successful AI adoption in manufacturing, stakeholders must prioritize the following



**Organizations should emphasize on starting with a well-defined business case and establishing in-house capabilities for early success.**



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# Gaming, Immersive Tech, and AI

**By Mr. Mayank Singh - MBAEx Class of 2018**

Before I start this piece, I must apologize in advance for a few idiosyncrasies. I do not usually adhere to the Chekhov's Gun principle of narration. Keeping that in mind, let me start with an incident that took place more than a decade ago, when I was stressed about passing a laboratory exam, in my engineering days. As much as I had been fascinated with IC engines and turbo machines (ever since I saw the Batmobile with turbine thrusters in the animated TV series), I had limited conceptual understanding of how they work. Ironically, while I could answer a lot of higher-level questions, it was a basic one that caught me off guard - "Define Heat." Suddenly, I was falling into an abyss. The question was too fundamental in nature. All I could think of was "Heat is energy in transit." but that was not enough. There is a definite way to define 'heat' that eliminates all ambiguity about the concept; and my definition did not talk about important aspects like temperature difference, modes of transfer, time rate etc. Long story short, given enough thought, properly defining something is a doable task, when it comes to concepts in most natural sciences. Once done correctly, the definition or meaning attached to such notions mostly remain unshakable, eternally.

Contrast this with other disciplines that have a social element as an integral part of them, and the story becomes a lot trickier. Take for example another situation. Several years later, I was sitting in a class that was basically 'Marketing 101'. A definition comes up for 'Marketing', "the activity, set of institutions,

and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large". Now be honest with me, does this definition explain 'business' itself? The idea was not perhaps as convoluted as it is today, or at least our basic sense of it was not, when the term 'Marketing' was coined. However, the definition must have changed as our understanding of the concept developed at a deeper level, and even the society around us evolved to what it is in the present state. Long story short, again, there are certain constructs in our daily lives which we hear, talk about, practice, and we are perhaps even part of, that may appear stationary, but in fact they all have an evolving nature.

'Gaming', 'Immersive Tech', and 'AI', the topics of this article too, are ever evolving domains. With time, the expectations from these and the boundaries that define them have been in a flux, and for the foreseeable future would remain to be in a state of flux.

Complexities aside, if I were to explain the term 'Immersive Tech', I would simply put it as a notion of encapsulating video game development technologies, gamification principles, and an array of new age devices/infrastructure, that are being used to deliver enhanced experiences over traditional methods. With this working definition, I can claim that **XRC Studios**, the company I work for, is in the business of providing 'Immersive Tech' solutions.

Even more exciting is the fact that games today do not even have to render all the details in a scene, they can be created by AI systems like DLSS (in Nvidia powered systems) on the fly. Animate entities, and environmental elements are much more dynamic and real with techniques like Ray Tracing and Game Physics. A soon to be launched capability that tech companies are working on, is moving beyond AI image generation and enabling users/creators/game-engines to generate videos and 3D assets on the fly. This, combined with 3D scanning hardware is opening doors for not just easy game creation, but actual digital twin creation for industrial and other use cases such as tourism.

NPCs (non-player AI characters) have become ever livelier with natural language processing. In turn, we are seeing proliferation of these ideas into other domains such as NEWS and Sports broadcasting (AI anchors). All in all, these and several other game development approaches have paved the way for highly realistic phygital experience use cases, for a wide variety of solutioning.

A reasonable doubt that might come to mind would be, whether all these would really be accessible to the masses? This is where companies like ours (**XRC**) have been active. We have taken a browser based WebGL and WebXR approach to bring these capabilities to the wide audience. Others have taken a slightly different approach where cloud computing is put to its best, with pixel streaming being the backbone of the experience. With these, and other similar caveats, owning expensive edge devices would not pose as a bottleneck in the widespread distribution.

These recent years have been particularly exciting for at least people of my generation (nerdy kids of the 80s and 90s to be more precise). Not because we are witnessing engineering and scientific marvels that are beyond imagination, but because things that we only enjoyed in pop-culture are coming to life as we speak. I remember that in the year 1990, Arnold Schwarzenegger emerged with the movie *Total Recall*. The movie had elements like: Virtual reality, Thin panel displays, Location tracking/navigation, Video calling, Self-driving cars, X Ray Security checks, Space colonization and terraforming, among other sci-fi ideas, incorporated into an action thriller. Fast forward 30 years into the future, all these ideas have manifested themselves in some form, to a certain degree, in our present society. And the promise of technology is that things, at least in the immersive tech and AI space (if not space exploration or bioengineering), would get even more interesting, as we already see breakthroughs in areas like Quantum Computing and Wetware Computers on the horizon.

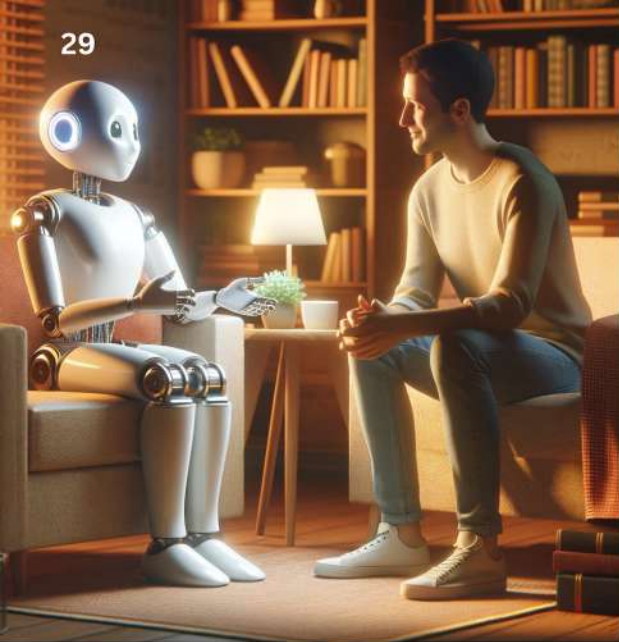


## Mayank Singh

**GLOBAL OUTREACH MANAGER AT XRC, IIMC**

An innovative and dynamic professional with extensive experience in various industries, including automotive, gaming, business development in Asia and Germany, and founding a comic and digital content company.





# My new best friend: AI

**By Mr.Nilanjan Mondal – MBAEx Class of 2017**

I almost named my daughter AI! I was torn between AI and GPT (inspired by Elon Musk's X Æ A XII but lacked the creativity that he possesses).

The wife threatened to leave (along with the baby) unless I gave up on the idea, and I had to concede. In hindsight, I think she wasn't wrong! On most occasions, she isn't!

But, in my defence - imagine this -

A GGP equivalent party in Silicon Valley, a splendid evening of grandeur, with a resplendent attendance of all the latest technologies and applications who are proudly contributing to make the world a more predictable, uniform and automated place, or, in other words a "significantly better tomorrow". With sumptuous starters of the latest IC chips, followed by an eclectic main course of impressive processing prowess, technologies are indulging in mirth and merry making! The downtempo beats of the lo-fi music are only adding to the charm of the evening. The icons of yesteryears are smiling at the dashing youthful arrogance of the heartthrobs of today. Moore's Law, a regular in these parties who has always enjoyed attention, is found simping over edge computing.

And suddenly, the lights are dimmed. The star-studded room is slightly taken aback. The music gradually fades into a distant din. Slowly the central staircase is lit up by a spotlight, not very sharp but with slightly

softer edges. The technologies strain their eyes hard to see if the drama is worth the entrance. A pregnant silence grips the room. There is anticipation, and there are bruised egos already!

And slowly, as if descending from the parted gates of heaven, you have AI, the coolest thing ever, sashaying down the grand staircase, shrouded in an intricately woven cape of enigma. The technologies wait with bated breath.

AI, the cynosure of all eyes in the party, glides around the ballroom barely disclosing any preference for a specific technology in the room to partner with.

The technologies and applications have given up on restraint and have now started showing desperation to pair up with AI for just one dance, called the "Dance of Relevance".

Someone in the room whispered, "Once AI touches you, you transform to become immortal"

Now, tell me, am I too off, when I say that I have been drawn into the magical realms that AI promises?

Of course I am not the only one enchanted by this enigma - you do remember what happened that evening at the party of technologies, right?

In case you need more proof - between June 2022 and March 2023, the search volume for the term "AI" has almost quadrupled from 7.9 million searches to 30.4 million searches per month (according to Statista).

So, who is this AI?



AI, or Artificial Intelligence is a field within Computer Science which enables machines to act like humans in making decisions. This is made possible by enabling the system to ingest large amounts of data, process it, recognize patterns, draw insights, and make predictions based on the statistical probability derived from the ingested data. This explanation, by no means, should be considered a literary description of AI and its capabilities. This is just a very broad based, dumbed down attempt of ensuring a common starting plane for what is to follow.

As you can imagine, there are innumerable aspects in our lives that are touched by AI. Starting from auto-completion of sentences in emails and auto-corrects in our phones to managing risk profiles and detecting frauds in fintech, across manufacturing, and even agriculture.

In fact, the list of aspects that are not touched by AI will be easier and shorter to create, if it does exist at all.

Let us try and explore the various shapes and forms that AI takes. Very broadly speaking, AI can be roughly categorised into 4 areas -

**Reactive AI** - Reactive AI algorithms operate on present data, using statistical maths, considering huge chunks of data to produce an intelligent output. It is limited in its capabilities in using previous experiences to inform present and future actions. Recommendation engines and automated filters are 2 areas of applications where reactive AI is most used today.

**Limited memory machines** - Based on our understanding of how the human brain works, this algorithm has been developed to imitate the way the neurons in our brains connect. This is deep learning, and the most interesting part of this algorithm is the way it can improve through a continual process of training on more data. Pattern recognition is an area that this algorithm finds most applications and excels in, besides being used in chatbots,-

virtual assistants and language learning models.

**Theory of Mind** - This is a term derived from psychology. This refers to a machine's ability to attribute mental states, such as beliefs, intent, and emotions to other entities. While this capability will have deeper and far reaching applications, we are yet to see AIs delivering reliable results in this realm.

**Self aware AI** - This clearly belongs to the highest echelons of evolution in this field, where a machine becomes conscious of its own emotions, beliefs, and state of being as well as of the other entities'. Needless to say we are yet to significantly start exploring this space

**Now a quick look at what AI doesn't feel the most comfortable doing -**

**Delivering consistent and reliable interpretability** - AI models are generally trained to group data together and arrive at outcomes on the basis of probabilities. This leads AI models to reach outcomes based on correlation rather than on causality.

**Misguided output** - The quality of output of a model is heavily dependent on the quality of data used to train the model. At present there is barely any governance that ensures that the data used is verified and of high quality. This has led to outputs having questionable accuracy, thus rendering it non-actionable, or actionable in a limited remit.

**Amplified biases** - Historical data is replete with existing socio-cultural biases. A model learning from such data ends up not only inheriting the bias but also amplifying it. This amplified bias is then proliferated across the multiple layers of the ecosystem. This demands a high vigilance to ensure diverse and authentic data is used to train models to minimize subconscious and unconscious bias.

Now, I am not officially trained in AI nor do I lead engineering teams that pioneer in creating applications using AI. Then what authority do I have to talk to you about the subject?

Well, I speak using the authority that comes from being an active participant in a connected world where AI is my co global-citizen.

Even if you live in a cave, you already know by now that AI is the new sunlight, given that its presence and influence is as expansive as that of the sun!

So, to sidestep the risk of sounding generic, from hereon I will restrict myself within the realms of AI in digital advertising - as this is the space that I am deeply entrenched in, in my professional life.

Digital advertising is slowly turning into a beautiful paradoxical world as this is one of the fastest evolving landscapes, poised at the tip on cutting edge computation, and at the same time, is in dire need of relevant policies and regulations, which is probably the slowest moving aspect whether in business or in governance.

Now, I can go into the obvious territory of describing how AI enables the creation of persuasive content that allows brands to personalize at scale, resulting in multifold increase in brand loyalties. Or, I can mention how AI sifts through terabytes of data to create aggregated consumer personas for effective targeting. Or, maybe we can delve deep into the way AI operates an automated real-time bidding algorithm within a fraction of a millisecond using deeply embedded psychographic signals at the cross-section of interests, affinities, demographics and life events. But all of these are realities today, and what is the fun in discussing something that is conspicuously glaring at us?!

Instead I want to talk about areas that AI is yet to fully exert its influence on. Because through that, I intend to address a palpable discomfort that all minds and -

discussion rooms are abuzz with. And that is -

### **With the world in AI's grasp today, how do I (as in, the human) stay relevant?**

I will start with the impact that AI can have in regulation and policy making in the field of digital advertising. But the same can be extrapolated to other areas of governance as well.

The following is a list of outcomes that we can strive to achieve, partnering with AI -

#### **Create policies led by values and goals instead of facts and historical evidence**

We, humans, can never beat a machine in ingesting and computing data, or in organising and referring to collected samples of filed evidence or facts.

Instead we can define goals, and boundary conditions based on socially and culturally relevant values. With this as the "what", machines can optimise towards creating the best version of "how".

#### **Organisational silos can potentially become folklores of history**

Humans are limited in their capability of usefully processing data that is voluminous and widely diverse. Sometimes silos exist in organisations, while at other times silos are created to retain relevance, thus paralysing effective policy making.

With the advent of AI, and its ability to recognize patterns and make recommendations, information will be democratised. This will allow visibility into relevant pieces for effective and holistic policy making

#### **Decentralised decision making with centralised access to data**

Data collection, sorting, organisation and housing can become centralised. With access to the same data pool, a parity and transparency in knowledge can be ascertained across the board. With pre-defined goals and guidelines, decision making can now become decentralised on the basis of a uniformly accessible data pool. This reduces the gestational period for policy making by eliminating bureaucracy, and helps

build an execution focused culture.

### **Adapt in real-time**

For new policies to be created, or existing ones to be amended, there are multiple complex steps that are involved. Observation, data collection, gathering statistically significant evidence to challenge status quo, acknowledgement from involved parties, defining new guidelines that are inclusive and balanced in incentives for consumers and enterprises, ensuring correct infrastructure for execution, on-field execution, and governance - just to name a few. Now, all of these steps are excruciatingly demanding in terms of time, resources and precision, thus resulting in significant lags and delays. This often renders a policy redundant or ineffective. AI can enable a bulk of these steps in real-time through its ability to generate insights from pattern recognition, among many, and significantly impact the effectiveness of policies and govern execution.

Well, that sounds bright and hopeful, but the question still remains, in our journey towards this transformed world, how do we continue to be relevant?

Now here is where I start to theorise, and run the risk of sounding somewhat old and boring. And, that is precisely why I am happy to leave this section open for as much collaboration and editing as possible.

From my lived professional experience in the ever changing landscape of digital advertising, here is a list of 6 items that I try to pursue. Now all of these approaches are not unique to a world propelled by AI, but these are a relevant reminder at this stage for sure.

1. The list starts with being **Hungry!** I don't mean the hunger that leads you to being a glutton but rather in spirit. We've all been overexposed to the over-used phrase of "Stay hungry, stay foolish". Yes, this is a recall of that. AI is here today, and you can't just will it away in your quest to stay relevant. We need to dive into this. Not all of us are equally -

equipped to grasp all aspects here, but the stronger the hunger the better will be the identification of the areas that pertain to our areas of work. Imagine!

2. Be **Unabashed** - about exploring areas in your sphere that can benefit from partnering with AI. While doing this, we may come across as outrageous in challenging the status quo, or may even be taunted for letting ourselves follow the "hype". But being unabashed in our quest to explore areas of partnership will hold us in good stead.

3. We need to be intentionally **Meticulous**. This is something that is quintessentially applicable across all aspects in life - personal and professional, but does merit a mention nevertheless. With the advent of AI across almost all aspects of life, there is a seismic shift in expectation for consistent high quality. Consistency in delivering high quality used to be a differentiator for products and brands, but this is slowly becoming a hygiene parameter across industries. This demands a mindset shift in terms of holding ourselves accountable to consistently delivering high quality, thoroughness, and precision. AI delivers on the basis of ingested data, patterns and historical events. Being meticulous will enable us to identify deviations or variations from repetitive historical occurrences, thus enabling us to add quantifiable value to the ecosystem.

4. Be an **Amateur!** Or, in other words, we need to hold on to that 20-something self of ours who is secure in acknowledging that there are more things that we do not know than the things that we do. With growing exposure and experience, more often than not, we trap ourselves into the perception of being an expert. But a static expert is way less valuable than a dynamic amateur. All of us will have different starting points as we begin to partner with AI. An amateur mindset will empower us to absorb effectively and efficiently.

5. Be **Nimble!** This is an organic progression once we are comfortable in being an amateur. Having liberated ourselves from the self-

imposed burden of being an expert, we need to be nimble, and be a generalist or a specialist as per the requirements of the ecosystem. A casual internet search will throw up an umpteen number of articles on who you should be - generalist or a specialist - in today's world.

AI powered machines trained extensively on a specific kind of data, will always be a far better specialist than a human can ever be, in delivering near perfect outcomes. With this as the frame of reference, you will be able to add value by being a generalist, as an AI generated outcome needs to be juxtaposed against the broader context.

But for an AI model to be trained on relevant marketing data, performance metrics, quantifiable customer insights, and business goals that are aligned with macroeconomic conditions, you need to be a specialist with quality experience in the field of digital advertising.

So, irrespective of which article you read on the internet, be absolutely light-footed to switch from being an amateur to a mentor.

6. Keep **Evolving!** AI is one of the many monumental technologies that have been created in the past 100 years. The reason why AI is different is because this technology enables the algorithm to learn and improve with exposure to more relevant data. Value creation lies in evolving. There are innumerable cases of mega enterprises that once ruled the roost in their respective industries, running aground. And, the common thread that ties all those occurrences is that of a failure to evolve. The speed at which AI is proliferating across applications across the board will soon become the benchmark for change.

These are all areas where AI is significantly lagging behind us. There is no harm in building on a lead that we already have!

The value of being a human lies in being imperfect. But it is important to earn the right to be imperfect, by striving to evolve and by willing to take risks.

The human aspects cannot be encompassed within the realm of a binary "right" or "wrong". There are different versions of "right". And maybe one of those versions is best suited in a situation, but that again is determined by the real time emotional response of the recipient. And, this emotional response or reception of your audience may not be explicitly mentioned but may be subliminally expressed. But unless this is entered into a processor actively as an input, even a super intelligent AI might perform sub optimally.

AI is a threat only if we compete with it. The objective should not be to rely on areas that machines deliver imperfectly on, because those areas will stop being a reality soon.

This is not a unique perspective on thriving in an AI powered world, and for all you know, this might be irrelevant in a couple of years from now. But that is exactly the point - algorithms do not have the liberty to be wrong and still be relevant, but we do - as long as we - are hungry to learn, unabashed in our quest for exploration, meticulous in our work ethic, adaptable in our approach, nimble in our responses, and keep evolving! Or in other words, as long as we strive to be more humane in our ways!

You didn't see that coming, did you?!



## Nilanjan Mandal

### TIKTOK, IIM CALCUTTA

Nilanjan is a keen learner who has been across healthcare and adtech industries through the lenses of product marketing and product management.





# LATTICE

## INNOVATION UNLEASHED

The prestigious Indian Institute of Management Calcutta (IIMC) held its 15th Annual Business Conclave, Lattice on August 19, 2023, with the theme as "Innovation Unleashed". The day-long symposium, organized by the institute's 17th batch of MBAEx students, convened top industry leaders to discuss innovation and the future of business.

The event kicked off with opening remarks from HAL Chairman Ananthakrishnan, whose company co-sponsored the conclave. He spoke about innovation in aerospace before passing the baton to keynote speaker Rohan Verma, CEO of MapmyIndia.

Mr. Verma charted his entrepreneurial journey before Google entered India. He explained how MapmyIndia's customer-funded model provided mapping APIs to major companies. Mr. Verma also highlighted an innovative MapmyIndia feature launched during COVID-19 which showed test center locations. The morning keynote series concluded with boAt Lifestyle CMO, Aman Gupta's insights on building an aspirational brand story and disrupting consumer tech.

Post lunch, Moderator Dr. Nandita Roy from the Business Ethics & Communication group of IIMC led executives Mr. Praveen Kumar : CEO-India, Barclays; Mr. Sanjay Ojha: Co-Founder & CEO Sirius AI; Mr. Naveen Agarwal : Partner, Ernst & Young LLP; and Mr. Pulak Pattanayak: Co-founder Director, VCNow in a spirited debate on invention vs innovation, data alignment vs data privacy, personal information vs consumer data, and the perennial Right vs Left.



# HOMECOMING WELCOME

# PGPEX 2013



## Class of 2024 welcomes Class of 2013

Some facts about class of 2013:

- First Batch to participate in FT Rankings.
- First student ambassador and branding committee came from this batch (Rittick Banerjee, Rajarshi Sen and Disha Chhabra).
- Affectionately called "The Explorers" for their exploring spirit w.r.t. internship.
- Sponsors the IIMC PGPEX Sixth Batch Alumni silver medal for "Greatest Contribution to Campus Life".

# HOMECOMING WELCOME

# PGPEX 2014



## Class of 2024 welcomes Class of 2014

Some facts about class of 2014:

- First couple Anika Agrawal & Gunjan Rana to join the programme in the same year.
- First lawyer (Saurabh Kumar) to join the MBAEx programme.
- First-time compulsory international immersion to overseas partner schools -Mannheim Business School, Germany and Ashridge Business School, United Kingdom in 2 groups.
- Samara Dielle Almeida: 4.03 CGPA has remained one of the highest CGPA till date in the programme.



*Batch of 2024*





में आया तन्हा  
पर तन्हा था मैं कहाँ

जो पत्तों से छनके, पहले दिन ही धूप ने आँखों पे खनक मारी  
मानो बड़े दिनों किसी ने प्यार से गालों पे दी हो दुलारी  
लकड़ी के पुल से झील ऐसे पार की, जैसे पार की हो सरयू सारी  
मानो पहले दिन ही लगा यूं कि रामसेतु पर इतिहास लिखने की अब है मेरी बारी

कोयल की कूक बिगुल की तरह बजी, और NAB की छत मेरी पलकों के ऊपर सजी  
कुछ तेज अलग सा ही अंदर दौड़ चला, काम काजी देखो आज पढ़ने चला

सबके मन थक चुके थे, कुछ कहीं पे अटक चुके थे  
कुछ के डगमगा गए थे कदम, कुछ को खुद से ही हो रहा था भरम  
कुछ की सर उठा की बात करने की आदत चली गई थी, तो कुछ की तो जुबानें ही छीन ली गई थीं  
पर सबकी सोच बहुत बड़ी थी, और उससे बड़ी थी चाह अपने आप पर फिर से विश्वास करने की

सब हार के आए थे कहीं ना कहीं से, कुछ ने हारा था पाया हुआ कुछ  
कुछ को बिना पाए, कुछ हारा लगता था  
कुछ ने हारी थी जीती हुई खुशियाँ  
तो कुछ थे खुद, कहीं न कहीं खुद से ही हारे

कुछ कमी सी महसूस हो रही थी कर्मभूमि में,  
कुछ और करतब सीखने बीच हैं इस खेल में  
या शायद यहाँ बस कमज़ोर विपत्तियों से टकराऊँगा  
इधर बहादुरी दिखलाऊँगा, तो वीर कहाँ कहलाऊँगा

या शायद ये रणभूमि ही काफ़ी छोटी है, वो यूं नहीं कि मेरी ही गुट्टी खोटी है  
वो यूं कि पता है मुझे कि उस मैदान का बड़ा छोटा था व्यास  
इससे बड़ी तो छलांग लगा देता मेरा चेतक, जब उसको लगती है प्यास

पर यहाँ मैं आधे से भी कम बदला, ज़्यादा बदला मैं झील के उस पार  
जहाँ अपने कमरे में मैं कर रहा था लोगों का इंतजार  
बिस्तर छोड़ मैं बाहर निकला, लोगों के अंदर का जानवर निकला

बाकी का साल निकला हमने मस्ती में, आलू परांठा, मैगी, चाय सस्ती में  
लेकिन जब पढ़ने बैठे तो ऐसे की आग लगे पूरी बस्ती में...

Anuranjan Mishra  
(SuryaKiran)



# Life at Joka

CLASS OF 2024







IIM Calcutta's One Year Residential MBA Programme