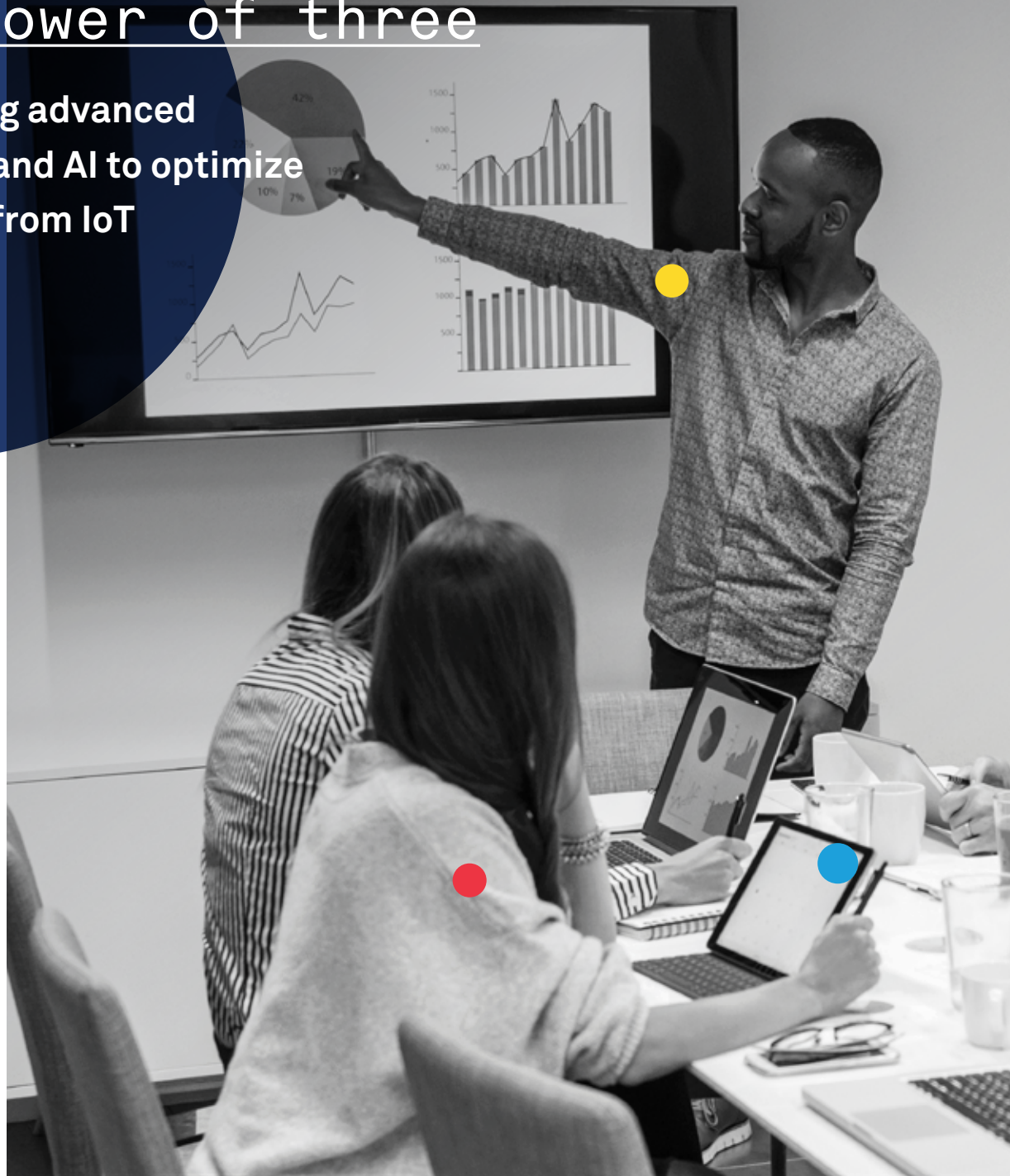


The power of three

Harnessing advanced analytics and AI to optimize the value from IoT



The Internet of Things (IoT) is enabling businesses to evolve into a data-driven enterprise. The value of IoT lies in making operational processes more agile and efficient by utilizing data to enable decision-making through advanced analytics. However, with analysts expecting around 50 billion connected devices by 2020ⁱ, how can enterprises tap the humongous reservoir of IoT data to generate value? The answer lies in leveraging Artificial Intelligence (AI) to unlock value from IoT.

While it is critical for an enterprise to sense and act, it must think and learn too like an intelligent enterprise. AI is the basis for this cognitive ability and this is the reason many startups and established companies are investing in building a cognitive future. This transformation requires apt architectures, applications, data, and tools.

Enterprise cognition: the fulcrum of the IoT revolution

The IoT ecosystem comprises a separate layer of devices (or ‘things’) that needs new architecture that includes communication protocols as well as information management and governance for building trust in data and Insights. The defining aspect is the generation of insights, as analytics is a key driver of success in IoT initiatives.

Advanced analytics and AI together breathe life into a network of connected devices. They enhance operational value, driving business

outcomes such as enhanced customer experience, improved operations and productivity, real time decision making, and recommendations for the next best action (NBA). This is made possible by harnessing the Big Data that becomes available from sensors and devices such as drones, autonomous vehicles, and traffic signals that record transactions, movements, environmental conditions, and other situational events. Consumption of such data to generate actionable insights is essential to providing more meaning to a network of connected things.

With organizations around the world realizing the need to deliver exceptional customer experiences, Analytics and AI must become the focal point of the IoT strategy in the quest to become a customer-centric intelligent enterprise. The ability of an organization to collect, store, analyze and squeeze actionable insights out of data from various disparate systems/things will be the deciding factor in obtaining the high value of cognition that is necessary for an intelligent enterprise.

Enablers of an intelligent enterprise

While there is no one-size-fits-all solution to enabling enterprise cognition, some common components are (See Figure 1):

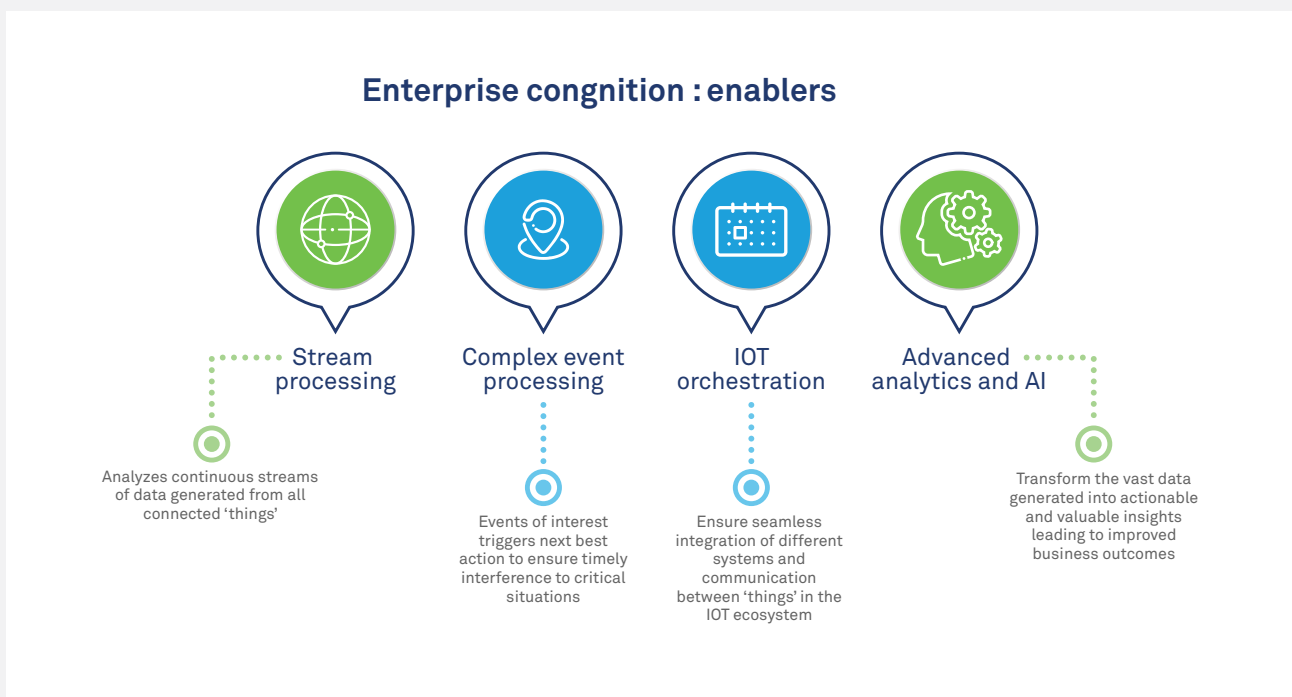


Figure 1: Enablers of Intelligent Enterprise

Stream processing: Data is generated continuously and an efficient stream processing system or platform is essential to effectively leverage the data for better decision making. It is imperative that the streams of data are consumed to generate real-time insights using sophisticated analytical algorithms as the value of these insights is short-lived. Predominantly, as data from an IoT ecosystem is in the form of time-series data, pattern detection and anomaly (events) detection algorithms are employed in conjunction with other models.

Complex Event Processing (CEP): An emerging network technology called CEP is triggered when an 'event' occurs and is used to translate incoming events data to provide timely insights into what is happening and recommends the NBA. An event could be a rise in share price, drop in heart rate, blood pressure, sensitive social media posts, customer activity on websites and so on. CEP is used in applications that require real time monitoring, and managing and predicting events. This provides any company with the ability to react quickly to critical situations to influence business outcomes and potentially save thousands of dollars - or impact patient outcomes and save lives.

IoT orchestration: The key to scaling a successful IoT solution is a full-stack dispatch and orchestration layer. An orchestration layer ensures interoperability, data management and coordinated communication between different 'things' within the IoT infrastructure. It involves integrating different applications with IT systems, cloud platforms and other entities to enable seamless real-time data synchronization. Addressing a business need generally requires multiple IoT solutions to work together, and significant value lies in such cross-vertical integrations.

Advanced analytics and AI: Analytics on IoT data produces actionable insights about customers, assets and business operations. Organizations are increasingly leveraging analytics and Robotic Process Automation (RPA) to build automated systems that improve productivity and ensure seamless business operations. Machine Learning algorithms are used to make sense of the vast data that is available as well as to build algorithms for control systems. Advancements in research on AI techniques like deep learning, cognitive learning, natural language processing

and computer vision have made interactions between things meaningful, while enabling task automation and work augmentation. With the increasing adoption of such emerging technologies, every industry is going through disruption faster than ever before.

In the manufacturing industry, preventive asset maintenance and fleet management have delivered transformational business outcomes. Insights into when a particular asset might reach the end of its lifecycle and when maintenance has to be scheduled are resulting in cost savings in maintenance and downtime that significantly increase the profitability of organizations. Similarly, in the healthcare sector, AI is revolutionizing healthcare delivery by enabling faster diagnoses, drug administration, case management and even remote healthcare service delivery. Such transformational outcomes lead to product and service innovation, in turn leading to the emergence of newer business models across industries. However, certain challenges stand in the way of organizations trying to harness the power of IoT fully.

Roadblocks to realizing value from IoT

Key challenges that prevent organizations from realizing complete value from IoT implementations include:

- IoT is a vast ecosystem of technologies and solutions and there is no single vendor that can deliver the full value of IoT. Business leaders need to collaborate with different players to assemble an IoT stack and ensure the entire IoT solution is integrated as required.
- IoT solutions are highly complex by nature, posing major challenges to organizations in governance, regulation and control of hyper-automation that IoT will eventually bring about. Organizations should have comprehensive reference architecture and robust processes for their IoT Solutions, and build AI-infused self-learning control systems.
- With the increasing number of devices from various vendors set to become a part of the IoT ecosystem, the information exchange between all 'things' is a challenge that organizations must overcome. Interoperable platforms and technology powered by AI is crucial in this respect.

- Real-time analytics require strong processing platforms to handle streams of incoming data. Lack of expertise in streaming analytics and other IoT technologies is a major challenge for many organizations as adoption of modern data platforms and architecture capable of handling vast data is still primitive.
- Acquiring skilled talent is a barrier to success in the digital, data, advanced analytics and AI markets as the technology is still evolving. Organizations should either look at setting up Centers of Excellence (CoEs) with the help of partners or tap into emerging crowdsourcing opportunities.

Moving ahead: appreciating the potential and the complexity of IoT

IoT is more than a next-gen technology. It has become a strategic priority for businesses today. It is becoming increasingly clear that analytics at the edge of connected devices and AI applications will be a major future success driver. To succeed in the new environment, organizations must have a clear vision on how an IoT ecosystem is likely to transform their organization into an intelligent enterprise. This requires taking stock of the current maturity of end-to-end technology systems. Sufficient importance must also be given to aspects that will enable real time actionable insight generation – a critical factor in powering an organization’s journey to becoming an intelligent enterprise. While there are major challenges for organizations in building an end-to-end IoT ecosystem, the potential gains far outweigh the roadblocks as IoT holds tremendous opportunities for sustainable business success.



About the authors

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Kunal has 15 years of experience in AI Thought Leadership, Advanced Business Analytics, Decision Systems and Data Science. He has been actively involved in building products, creating solutions, formulating strategy and executing analytics program in-house and for customers. He has worked on creating analytics content strategy for world's first industrial internet platform. He helps customers build/enhance/modernize their AI platform and governance strategies. Area of work includes: Text Mining, Predictive Modeling, Machine Learning, Deep Learning, Algorithms, IOT, AI and Blockchain.

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