

SERVICE

Digital and Advanced Technology

Engineering is undergoing a fundamental transformation. For decades, the focus was on designing and building physical assets that delivered specific outcomes. Today, industries are increasingly seeking assets that can do more than perform a function. They must generate insights, support faster decision-making, improve operational efficiency and adapt to changing requirements throughout their lifecycle. As a result, intelligence is becoming as important as physical infrastructure itself. This shift is redefining the role of engineering. Digital Twins, simulation platforms, artificial intelligence, automation and advanced analytics are no longer viewed as standalone technologies. They are becoming integral to how assets are designed, delivered, operated and maintained. At the same time, strategic sectors such as energy, infrastructure, manufacturing, defence and space are demanding increasingly sophisticated engineering solutions that combine precision, reliability and intelligence.

Tata Consulting Engineers' Digital and Advanced Technology Business Unit (DATBU) operates at the intersection of engineering and technology. Unlike sector-focused businesses, DATBU serves the entire TCE ecosystem, bringing digital technologies, advanced engineering and automation capabilities into projects across industries. Its role is to make engineering smarter by creating intelligent systems, advanced digital platforms and specialised engineering solutions that improve performance, reduce risk and solve increasingly complex challenges.

Industry Trends and Market Outlook

Across industries, the boundaries between engineering, digital technologies and automation are rapidly disappearing.

Organisations are moving beyond traditional approaches to project execution and asset management, adopting connected digital environments that provide visibility across the entire lifecycle of an asset. This evolution is creating demand for solutions that combine engineering knowledge with digital intelligence to improve decision-making and operational performance. One of the most significant developments is the growing adoption of Digital Twin technology. Digital representations of physical assets are enabling organisations to simulate performance, evaluate operational scenarios and optimise decision-making before changes are implemented in the field. Combined with advances in artificial intelligence and machine learning, Digital Twins are increasingly becoming a foundation for predictive operations and lifecycle management.

The role of Building Information Modelling (BIM) is also evolving rapidly. What began as a 3D design tool is now becoming a comprehensive lifecycle platform that integrates engineering, construction and operations into a single digital environment. This approach is helping organisations improve collaboration, reduce project risk and enhance long-term asset performance.

Simulation-led engineering and model-based design are gaining importance across infrastructure and industrial projects. Virtual validation, digital commissioning and advanced simulation environments are helping organisations reduce uncertainty, improve quality and accelerate project delivery. At the same time, robotics, remote handling systems and intelligent automation are becoming critical in environments where safety, precision and reliability are paramount.

Strategic investments in defence, space, advanced manufacturing and high-technology sectors are further accelerating demand for complex engineering solutions. Organisations increasingly require systems that combine mechanical excellence, digital intelligence and automation to operate in challenging environments and deliver consistent performance. These trends are creating opportunities for organisations capable of combining deep engineering expertise with advanced technologies. As industries become more connected, autonomous and data-driven, the demand for intelligent engineering solutions is expected to grow significantly across every sector that TCE serves.

Engineering Intelligence in Action

DATBU was established to bring together capabilities that traditionally existed in separate domains. Rather than viewing digital technologies, advanced engineering and automation as independent disciplines, the business integrates them into a single problem-solving framework that helps clients address increasingly complex challenges.

Its capabilities span digital engineering, Digital Twins, BIM-led lifecycle solutions, simulation environments, AI-enabled automation, robotics, product engineering and specialised engineering equipment. Together, these capabilities create an intelligence layer that strengthens engineering outcomes across the organisation's industry portfolio.

This integrated approach enables DATBU to contribute across a wide range of applications. In some cases, the business helps clients visualise, simulate and optimise assets through digital platforms. In others, it develops specialised engineering systems designed to operate in demanding environments where precision, reliability and safety are critical.



“The future of industry will be shaped by the convergence of engineering, intelligence and automation. Our focus is on creating solutions that combine deep engineering expertise with advanced technologies, helping clients solve complex challenges and build smarter, safer and more capable operations.”

Pravin Shahu
Head Digital & CIO (Global)

Making engineering smarter through intelligent systems, digital platforms and advanced technologies.

Increasingly, the convergence of engineering, automation and digital technologies is allowing DATBU to create solutions that deliver both operational value and long-term strategic advantage. The business also plays an important role in strengthening collaboration across TCE. By working closely with sector-focused businesses, DATBU helps integrate digital technologies and advanced engineering capabilities into broader project solutions, creating differentiated value for clients while expanding the scope of technology-led services across the organisation.

Its growing expertise in advanced engineering systems, robotics and automation has enabled participation in highly specialised programmes where conventional approaches are insufficient. At the same time, its digital engineering capabilities are helping organisations improve lifecycle management, accelerate project delivery and make better use of operational data.

Delivering Intelligent Solutions

FY26 was a year of resilience and progress for DATBU. Despite a challenging market environment, the business achieved its highest-ever revenue performance, representing strong growth over the previous year and reinforcing the relevance of its technology-driven offerings.

A defining achievement during the year was the successful delivery of a first-of-its-kind articulated robotic transporter developed for one of the world's most complex scientific programmes. The project required the integration of advanced mechanical engineering, automation, controls and systems design into a highly specialised solution capable of operating with exceptional precision and reliability. Its successful execution significantly enhanced DATBU's credibility in strategic and high-technology sectors. The business further strengthened its presence within the international fusion energy ecosystem through additional wins and expanded engagement in specialised engineering programmes.

These opportunities reflect growing confidence in DATBU's ability to support complex projects requiring advanced engineering expertise, precision execution and innovative problem-solving.

Customer relationships continued to deepen across multiple sectors, resulting in repeat business and expanded opportunities. The diversity of engagements across industrial, manufacturing and technology sectors demonstrates the adaptability of DATBU's capabilities and their relevance to a broad range of engineering challenges. Digital engineering emerged as a major growth area during the year. Increasing adoption of BIM-led solutions and digital engineering services resulted in important project wins.

International engagement also expanded significantly. The business witnessed increasing enquiry levels and proposal activity across Europe, Southeast Asia and the Middle East. This growing interest validates the global relevance of DATBU's capabilities and creates opportunities to participate in technology-intensive programmes across multiple regions.

Innovation remained central to the business strategy. DATBU continued to strengthen capabilities in product engineering, automation systems and specialised engineering solutions for industrial and strategic sectors. Its ability to execute highly complex projects while maintaining quality and delivery performance has strengthened its reputation as a trusted technology and engineering partner.

Capability building remained another important focus area. Investments in advanced engineering, automation technologies, digital platforms and knowledge systems improved scalability and enhanced the ability to pursue larger and more complex opportunities. These efforts are helping create a stronger foundation for sustained growth while ensuring that the business remains aligned with rapidly evolving technology trends.

Future Outlook and Priorities

The future of engineering will increasingly be shaped by the convergence of intelligence, automation and advanced technologies. As industries become more connected and data-driven, demand for solutions that combine engineering expertise with digital capabilities will continue to grow.

DATBU is focused on accelerating growth through larger strategic opportunities, stronger customer engagement and expanded international presence. The business will continue to strengthen capabilities in Digital Twins, BIM, AI-enabled solutions, simulation platforms and advanced engineering systems, enabling it to provide higher value solutions across industries.

Product engineering and engineering research and development services will remain important growth areas. DATBU aims to move beyond resource-based engagements towards solution-driven and outcome-focused partnerships that create greater value for clients while strengthening long-term relationships.

Robotics and specialised automation systems represent another area of significant opportunity. Building on experience gained through complex engineering programmes, the business intends to develop solutions that combine automation, digital intelligence and engineering expertise to address emerging industrial requirements. The business will also continue to strengthen strategic partnerships and international market presence. Growing engagement across Europe, the Middle East and other global markets is expected to create opportunities in advanced engineering, automation and digital solutions.

As industries seek smarter ways to manage assets, improve productivity and solve increasingly complex challenges, DATBU is well-positioned to create the intelligent systems, digital platforms and advanced technologies that will shape the future of engineering.



“Technology is transforming the way industries design, build and operate assets. By combining engineering expertise with digital capabilities, we help clients improve performance, enhance efficiency and accelerate their journey towards smarter, more sustainable operations.”

Pawan K Rallabandi
Business Head, DATBU