

# THE INEVITABLE RISE AND IMPACT OF DIGITAL ENGINEERING 2023

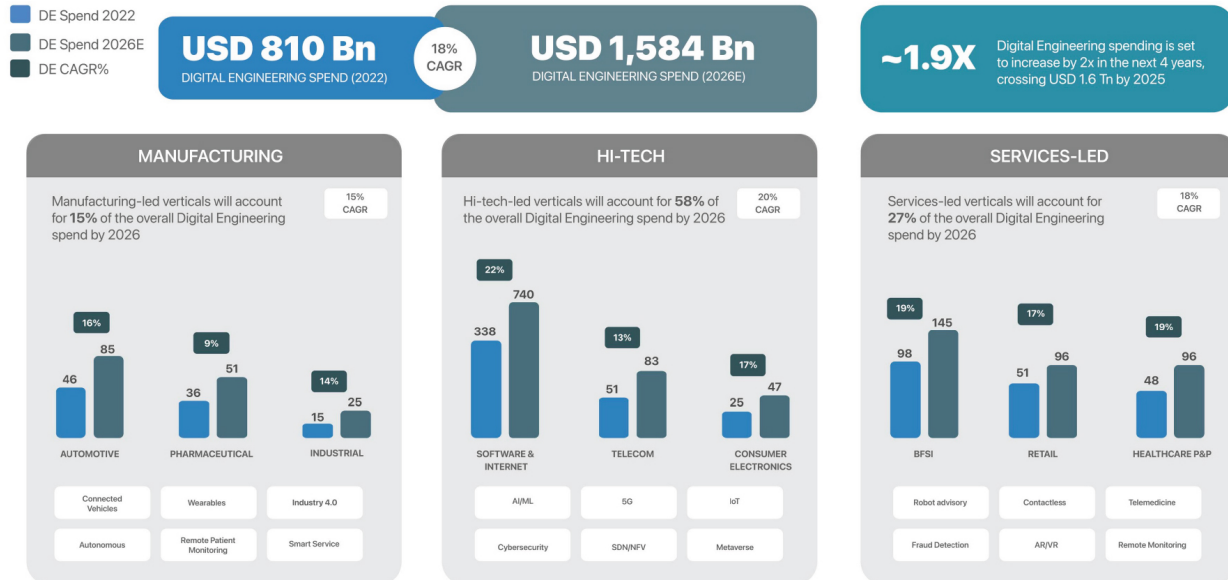
2022 was a year marked by geopolitical tensions, recessionary pressures, government protectionism, and supply chain constraints – around the world. But despite these headwinds, the global Digital Engineering (DE) spend – a subset of the global overall Engineering R&D spend – grew to touch USD 810 Bn in 2022. This is due to the pandemic-induced digitalization initiatives that continued unabated, with technologies such as Cloud, Artificial Intelligence, Metaverse, 5G, Digital Thread, etc., leading the charge. These technologies not only garnered significant investments, but also became sandboxes for exploring newer use cases and business models.

## **The Unabated Growth of Digital Engineering Spend**

Despite the macro-economic environment impacting different verticals to varying degrees, the DE spend will continue to grow and reach USD 1.6 Tn by 2026. CXOs are committed to innovation, despite this volatility, by funding it with cost optimization and productivity gains. Further, the continued focus on digital transformation and pervasive consumption on Cloud, chips, and data will fuel DE spending. With enterprises prioritizing Data Engineering and Analytics, Cybersecurity, and IOT capabilities, Service Providers (SPs) have a significant opportunity to capitalize on this need. In fact, SPs have witnessed

substantial growth in the last 12 months, driven by strong demand from the US and Europe.

By 2026, Hi-tech-led verticals will account for 58% of the overall Digital Engineering spend, followed by Services-led verticals



Manufacturing-led, Hi-tech-led, and Services-led verticals constitute the majority of the Digital Engineering spend. Growing at a 20% faster CAGR than Services and Manufacturing-led verticals, Hi-tech-led verticals – that include Software & Internet, Telecom, and Consumer Electronics – are the largest contributors to the **Digital Engineering spend**. Services-led verticals, especially consumer-facing ones, are experiencing a softened Digital Engineering spend owing to macro factors, but are still expected to grow at 18+% CAGR and account for 27% of the overall DE spend by 2026.

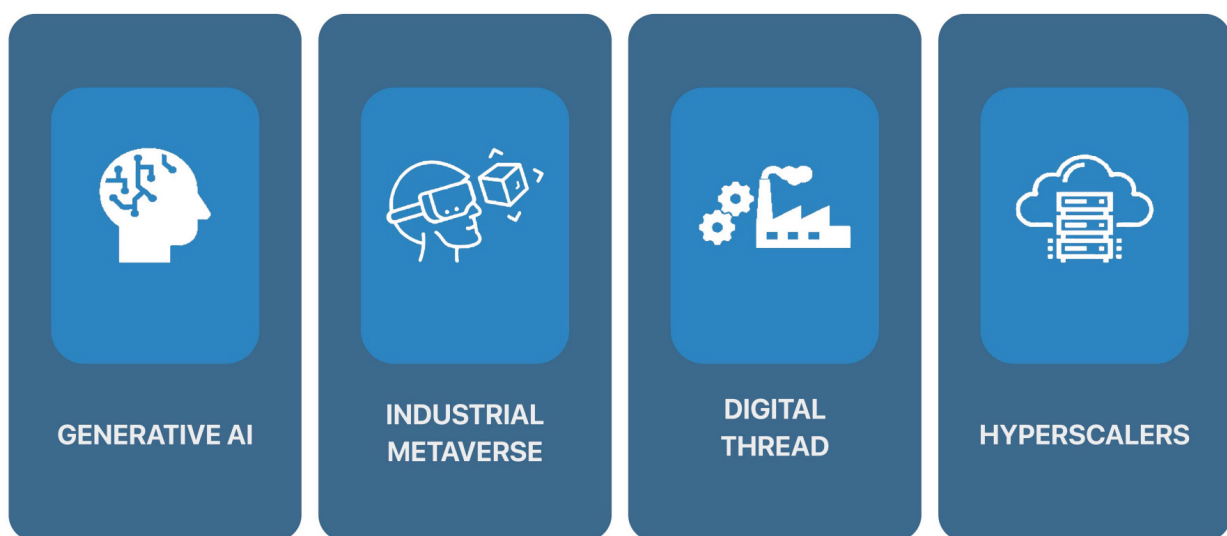
The heightened focus on Digital Engineering by Hi-tech-led verticals in Asia Pacific (APAC) region, has enabled it to marginally surpass Western Europe in ER&D spending. But North American enterprises

continue to be the largest contributors to the Digital Engineering spend, owing to the significant presence of Hi-tech-led verticals.

## Technology Pillars of Digital Engineering

Four key themes are driving the global Digital Engineering spend – Generative AI, Metaverse, Digital Thread, and Hyperscalers.

### Technology Pillars of Digital Engineering



Source: Zinnov Research and Analysis, Zinnov Z1000 database

- **Generative AI:** Though in its nascent stages, Generative AI's transformative power across industries is undeniable. It has the potential to understand user queries and generate new content in the form of text, images, audio, video, among many other formats, based on large sets of training data. Increased Venture Capital (VC) funding for [Generative AI](#) is fueling an array of innovative use cases that can potentially revolutionize how businesses operate in the near future. Interestingly, between 2018 and 2022, VC firms made 885 investment deals, and Generative AI companies raised a staggering

USD 13-14 Bn from VC firms. With Generative AI still evolving, Service Providers have a significant opportunity to tap into. By commercializing their Generative AI offerings in text, image, audio, and video platforms, SPs can cater to a variety of use cases across Services-led, Hi-tech-led, and Manufacturing-led verticals. SPs can develop proprietary IPs to address the most impacted business functions – Sales, Marketing, and Customer Service.

- **Industrial Metaverse:** Industrial Metaverse is at the forefront of [Industry 5.0](#), and is attracting an influx of investments across technology firms. The global Metaverse market is expected to grow at a massive ~58% CAGR to touch USD 4-5 Tn by 2030, and it has already garnered significant investments, with USD 110 Bn having been committed to Metaverse since 2010. SPs are proactively investing in [Metaverse](#) capabilities, to cater to the evolving needs of their clients. They are investing in co-innovation labs and COEs to build innovative solutions and Proofs of Concept (POCs). SPs are also building reusable IPs such as products and frameworks to enhance competitive differentiation. And with enterprises increasingly grappling with digital talent shortage, SPs' focus on upskilling and hiring new talent with skills in Blockchain and Crypto, UI/UX, AR/VR/MR, and AI/ML will be critical to capitalize on the impending opportunity.
- **Digital Thread:** The integration of a digital thread into [supply chain](#) systems enables companies to be better equipped to adapt and respond to supply chain disruptions. So, Connected Supply Chains

(CSC) interwoven with Digital Thread enable seamless flow of information of physical goods and services. The five stages of a CSC include Synchronized Planning, Intelligent Supply, Smart Operation, Digital Logistics, and Connected Customer. More than a third of the investments made in CSC services are being outsourced, and US enterprises account for ~44% of the overall outsourcing market. To drive innovation and meet evolving customer demands, top SPs are actively building a robust collection of in-house IP and accelerators.

- **Hyperscalers:** With heightened enterprise focus on [digital transformation](#), the demand for Cloud has also risen, especially in the services industries. This demand is projected to witness a CAGR of ~16% from 2021 to 2030, to reach a staggering USD 1.3 Tn at the end of the decade. Adding to this phenomenal demand is the economic, organizational, and societal impact of the pandemic, that serves as a catalyst for digital innovation and adoption of Cloud services. To capitalize on this opportunity, enterprises across services industries are strategically investing in multiple use cases and strengthening their capabilities across them. AWS, Azure, and GCP have established themselves as market leaders, with a wide range of products and services, collectively capturing a significant 58% market share.

## **The Path to a Greener Future**

Sustainability has become a top strategic priority for CXOs, as political, social, and regulatory pressures increase. This has also enabled major

investments in sustainability initiatives from PE/VC firms, with USD 6 Bn invested in Hydrogen-based start-ups in 2022 – a 3X increase in investment than in 2019. Also, sustainability is expected to influence USD 150-250 Bn of technology and operations spend by 2030. BY 2030, ~13 Mn new jobs with green skills will be created globally, making sustainability a top business priority for enterprises in the coming decade.

**The growing enterprise focus on sustainability is creating significant opportunities for Service Providers**



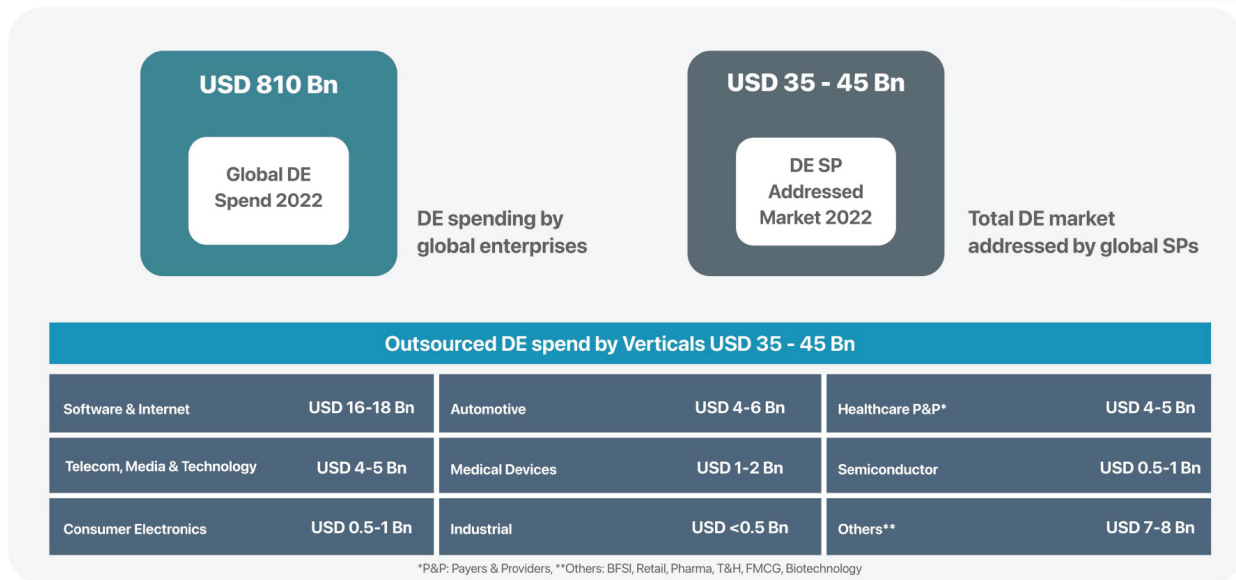
Source: Zinnov Research and Analysis, Zinnov Z1000 database

Global enterprises are focusing on four key sustainability themes to drive decarbonization efforts: Carbon Reduction, Clean Energy, Circular Economy, and Energy Management. Energy & Utilities, Industrial, and Automotive verticals are leading in the adoption of sustainability-related use cases. Companies are also introducing sustainability in products and services, driven by both operational excellence and product innovation.

To cater to this growing demand for sustainability engineering, Service Providers are bringing in innovation and expertise through an array of sustainable engineering offerings across product design, sustainable operations, energy transition, and reporting & analytics. These are not only accelerating enterprises' sustainability transformation, but also enabling them to achieve their net-zero targets.

## Service Providers and the Digital Engineering Opportunity

The total addressed DE market is pegged at USD 35-45 Bn in 2022



Source: Zinnov Research and Analysis, Zinnov Z1000 database, Zinnov GCC database

To cater to the evolving enterprise demand for Digital Engineering skillsets, SPs are enhancing their digital capabilities through collaboration, investments, and acquisitions. The total addressed DE market is estimated to be USD 35-45 Bn in 2022; this fragmented market is led by multiple specialists across geographies and verticals. Interestingly, the top 10 SPs capture 27% of the overall DE market. Also, leading SPs are going the inorganic route to enhance their digital capabilities through acquisitions to ensure they can deliver innovative solutions and meet evolving client needs. As the Digital Engineering

landscape evolves, SPs continue to drive digital transformation and enable enterprises to navigate the digital era effectively.

This marquee Zinnov study titled, “**The Inevitable Rise and Impact of Digital Engineering,**” is the benchmark for business leaders across verticals to identify strong partners for faster and more efficient deployment of Digital Engineering-led services initiatives across geographies. Besides evaluating the global Digital Engineering landscape, the study also provides a snapshot of Digital Engineering spends across verticals and how SPs are enabling end-to-end management of enterprises’ engineering requirements.

To know more about the Digital Engineering landscape and the opportunities therein, write to us at [info@zinnov.com](mailto:info@zinnov.com).

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