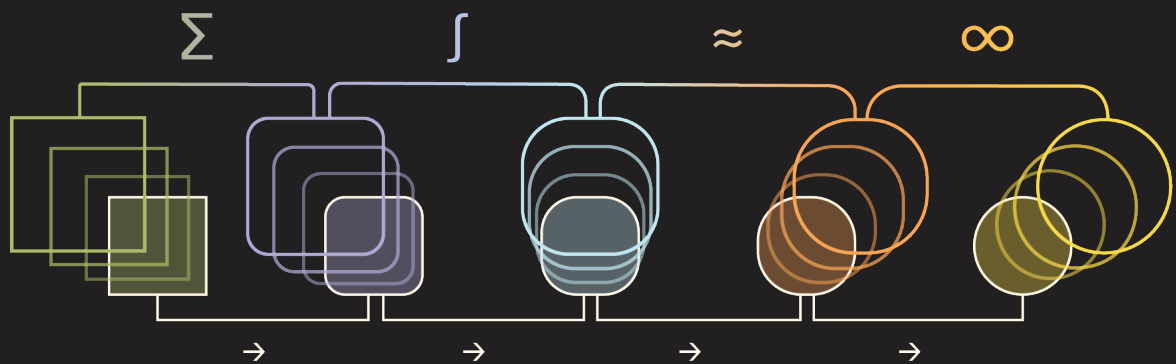




EMEA's Digital Twin Market: Growth, Innovation, and Impact

August 2025

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WorkNomads in a nutshell

WorkNomads was launched in 2021 with the vision of creating a nation without a country where talent is geographically unleashed, and diversity is celebrated. By providing remote engineering services and flexible coliving, we empower people to live and work from anywhere while contributing to high-impact global projects.

With a team of over 170 professionals representing more than 35 nationalities across Europe, Africa, Asia, and the Americas, we connect organizations with top-tier international talent and provide customized services and true partnership across the process of our work. Our engineers, designers, and advisors specialize in ICT engineering, industrial and infrastructure projects, as well as sales and data analytics are bringing expertise, flexibility, and a global perspective to every challenge.



1. How Digital Twin is changing industries?

A Digital Twin is a virtual replica of a physical object, system, or process that uses real-time data to simulate, monitor, and optimize performance. It bridges the physical and digital worlds, enabling better decision-making, predictive maintenance, and improved efficiency throughout a product's lifecycle.

Digital Twins are transforming industries by enabling smarter, data-driven decisions, reducing costs, and increasing efficiency. In manufacturing, they help optimize production lines, predict equipment failures, and minimize downtime through real-time monitoring and simulation. In the energy sector, they enhance grid reliability, monitor asset health, and improve the performance of systems like wind turbines, solar farms, and oil rigs. In healthcare, Digital Twins supports personalized care by modeling organs or entire bodies for better treatment planning. For smart cities, they simulate traffic flow, energy usage, and infrastructure performance to improve urban planning and sustainability. In aerospace and automotive industries, Digital Twins enable virtual testing, real-time performance tracking, and predictive maintenance to ensure safety and efficiency. In the construction industry, Digital Twins are revolutionizing how projects are planned, built, and maintained. They enable real-time visualization and simulation of buildings and infrastructure throughout their lifecycle - from design and construction to operation and maintenance. This helps identify design clashes early, improve collaboration among stakeholders, and optimize construction sequencing. Once a structure is built, the Digital Twin can continue to monitor performance, track wear and tear, and inform predictive maintenance, reducing long-term costs and extending asset life.

Why cross-disciplinary partners are essential for an industrial Digital Twin transition

The industrial world is entering a new era — one where the digital twin is not just a simulation tool, but a strategic asset.

At the heart of every industrial Digital Twin lies deep process understanding. Our expertise ensures that your twin mirrors not just the physical form, but the operational logic of your systems. By mapping each process step to its digital counterpart, we create a twin that is as operationally accurate as it is visually precise. Once the process is clear, the industrial infrastructure team steps-in. With integrating Building Information Modeling (BIM) with operational ICT systems we end up with a unified digital environment where:

- Design, construction, and operations data live in a single ecosystem.
- Physical changes are instantly reflected in the digital model.
- Multiple disciplines — from engineers to maintenance crews — operate from the same source of truth.

The Power of the Industrial AI-Twin Layer and Digital twin

An industrial AI-twin is more than a virtual replica — image a comprehensive and informed interior designer, tailored to your problems and needs.

Industrial AI is a dynamic, intelligent layer that evolves alongside your physical assets. By merging IoT sensor data, historical records, and AI-driven analytics, it enables you to:

- Predictive planning and preventative downtime – using predictive maintenance models, current and future production orders, pick in-advance the best time for maintenance, resource allocation and current production costs.
- Monitor workflows – by not only simulating process changes before implementing them in the real world, but also visualize your scenarios and growth strategies
- Pro-active controls – automate the time for passing through data and gain insights and possibilities fast and accurate

By creating a dynamic connection between physical assets and their digital counterparts, Digital Twins accelerate innovation and support more resilient, adaptive operations across sectors.

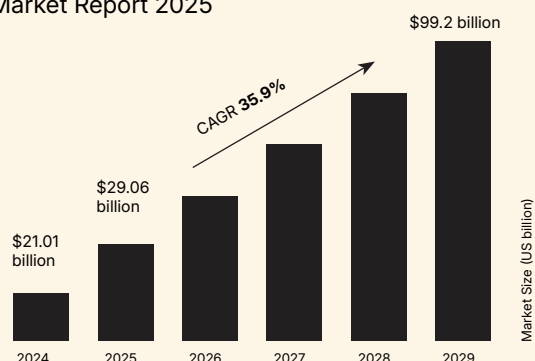
2. What are the Digital Twin market size in 2025 and growth rates?

The digital twin market size has grown exponentially in recent years. It will grow from \$21.01 billion in 2024 to \$29.06 billion in 2025 at a compound annual growth rate (CAGR) of 38.4%. The growth in the historic period can be attributed to a surge in the adoption of industrial IoT, adoption of 3D printing, and increased use of digital twins in the manufacturing sector. (1)

3. What Is the Digital Twin market growth forecast?

The digital twin market size is expected to see exponential growth in the next few years. It will grow to \$99.2 billion in 2029 at a compound annual growth rate (CAGR) of 35.9%. The growth in the forecast period can be attributed to growing demand for increasing demand for digital twins in healthcare, the rise in establishment of smart building infrastructure, and COVID-19 impact. Major trends in the forecast period include using digital twin for metaverse, innovation in technology, developing digital twin solutions to optimize supply chains and operational processes, adopting digital twins in the pharmaceutical industry for drug discovery. (1)

Digital Twin Global Market Report 2025



4. Major companies operating in the digital twin technology market

Company	Region	Specialties
Bosch Global Software Technologies	Asia (India)	IoT, Engineering Services, Embedded Systems
Infosys Limited	Asia (India)	IT Consulting, Software Services, Engineering Services
L&T Technology Services Limited	Asia (India)	Engineering R&D, IoT, Industrial Twins
NTT DATA Corporation	Asia (Japan)	IT Services, Digital Transformation, Smart Infrastructure
ABB Limited	Europe	Industrial Automation, Robotics, Power Grids
AVEVA Group Limited	Europe	Industrial Software, Operations Management, Asset Twins
Dassault Systèmes	Europe	3D Design, Engineering Simulation, PLM, Digital Twins
Hexagon AB	Europe	Geospatial & Industrial Software, Simulation, Reality Capture
SAP SE	Europe	Enterprise Software, ERP, IoT, Digital Supply Chain
Schneider Electric SE	Europe	Energy Management, Automation, Building Digital Twins
Siemens AG	Europe	Industrial Automation, Manufacturing, Digital Twin Platforms
Amazon Web Services Inc.	North America	Cloud Computing, AI, Data Analytics, IoT
ANSYS Inc.	North America	Engineering Simulation, Multiphysics, Digital Twin Validation
Autodesk Inc.	North America	Design Software, BIM, 3D Modeling, Infrastructure Twins
Bentley Systems Incorporated	North America	Infrastructure Engineering, BIM, Digital Twin Software
Digital Twin Consortium	North America	Industry Standards, Research, Ecosystem Collabora



5. Europe Digital Twin Market Size & Outlook, 2024-2030



It is estimated that the European digital twin market in 2024 was valued at USD 7.07 billion - USD 7.76 billion (about 28.3% of the global digital twin market). This represents rapid growth from 2023 – one report noted a 2023 European market of ~\$5 billion

The digital twin market in Europe is expected to reach a projected revenue of US\$ 42,824.7 million by 2030. A compound annual growth rate of 33.5% is expected of Europe digital twin market from 2025 to 2030. Within Europe, Germany leads in adoption – it's projected to hit \$12.46 B by 2030 – with the UK and France also seeing rapid growth (nearly 40%+ CAGR each). (2)

5.1 Sector-wise Breakdown

→ Smart Infrastructure (Smart Cities & Construction)

2024 Market Size: An estimated \$0.7–0.8 billion in Europe. Digital twin applications in smart infrastructure – including smart cities, urban planning, and construction/real estate – make up roughly 10% of the European market.(2)

Major European Companies:

- *Schneider Electric (France) and Siemens: energy management, smart buildings, etc.)*
- *Bentley Systems (through its iTwin platform) and Autodesk (through BIM 360 and digital twin services)*
- *Arup and Atos (France)*

Examples & Showcases:

- *Barcelona Supercomputing Center (Barcelona): Developed a digital twin of the city to simulate urban strategies like the "15-minute city" and support data-driven planning for accessibility and sustainability.(3)*
- *Cities of Helsinki, Rotterdam, and Zurich: Created 3D digital replicas of their infrastructure to monitor traffic, pollution, and energy use for smarter urban management.(3)*
- *UK Crossrail (Elizabeth Line): Built a comprehensive digital twin from over 250,000 3D models to simulate railway operations and maintenance before launch. ((4)*
- *Heathrow Airport (Terminal 5): Used a digital twin to analyze airflow, thermal performance, and energy consumption, helping optimize HVAC systems and meet design regulations. (4)*
- *Schneider Electric: Invested €1 billion in developing digital twin solutions for smart cities and buildings to enhance energy efficiency and sustainability. (2)*

→ Manufacturing (Industrial & Process Manufacturing)

Roughly \$1.5–2.0 billion in Europe (approximately 20–25% of the EU market).

Industry analyses show manufacturing (excluding automotive) comprises about a quarter of digital twin usage. This translates to the order of ~\$1.5 billion in 2024. (5)

Major European Companies (2):

- *Siemens AG (Germany): Industrial digital twins.*
- *Dassault Systèmes (France): 3DEXPERIENCE platform for simulation and CAD, adopted by over 50% of Fortune 500 manufacturers.*
- *Bosch (Germany) and ABB (Switzerland/Sweden) for factory automation*
- *SAP and PTC (IT Firms) providing industrial IoT twin platforms*

Showcases and Examples:

- *Siemens' "digital factory" implementations, such as the digital twin of its electronics manufacturing facility, have demonstrated up to a 30% reduction in production costs by simulating and refining processes virtually, leading to significant cost and downtime reductions. (2)*
- *Dassault Systèmes reports that its virtual modeling tools (e.g. DELMIA, CATIA) allow manufacturers to digitally prototype and stress-test factory layouts and workflows, contributing to faster time-to-market.*
- *Kongsberg Digital's partnership with Yara International (a Norwegian fertilizer manufacturer) to create digital twins of Yara's chemical production plants in Norway and the Netherlands, aiming to enhance operational efficiency and sustainability in the manufacturing process. (2)*

→ Automotive & Transportation

2024 Market Size: About \$3.1 billion (roughly 40% of the European digital twin market). The automotive and transportation segment is the largest in Europe – it accounted for ~40.7% of Europe's digital twin market in 2024. This equates to approximately \$3.1 billion in revenue (using the ~\$7.7B total market) for automotive-related digital twin applications.(2)

Major European Companies partnering with tech firms for simulation platforms :

- BMW Group (Germany)
- Volkswagen AG (Germany) and its brands (Audi, Porsche, etc.),
- Daimler/Mercedes-Benz (Germany)
- Stellantis (which includes Peugeot, Fiat, etc.)
- Renault/Nissan (France/Japan)

Examples and Showcases:

- BMW has developed a "Virtual Factory" program using NVIDIA's Omniverse (industrial metaverse) to simulate entire production plants. In 2024, BMW scaled digital twins for over 30 production sites. By virtually simulating assembly processes, BMW projects a 30% reduction in production planning costs for new vehicle launches(6)
- Volkswagen employs digital twins to simulate crash tests for vehicle design – this virtual testing cut development time by ~30% and is saving VW an estimated €50 million annually in prototype costs.(2)
- Renault uses digital twin models to optimize its manufacturing lines; one example is Renault's factory energy management twin, which reduced energy consumption by 15% on a production line by modeling and adjusting processes.(7)

→ Healthcare & Life Sciences

The healthcare digital twin market was about \$0.9 billion in 2024(7), and Europe represents a significant portion of this (estimated under \$0.5B). While relatively small, it is the fastest-growing segment due to rising demand for personalized medicine and digital health.(2)

Major European Companies:

- Philips Healthcare (Netherlands)
- Siemens Healthineers (Germany)
- Dassault Systèmes (France)
- GE HealthCare (US, but with European presence)
- Research Hospitals in Europe (e.g. Charité in Germany, Great Ormond Street in UK)

Examples & Showcases:

- Philips has developed digital twin models of human organs, including a "virtual heart," allowing clinicians to simulate and test treatment options. This approach has led to more tailored therapy plans and a 25% reduction in diagnostic errors by enabling doctors to virtually observe organ responses before treatment.
- Siemens Healthineers use digital twins of imaging equipment (MRI/CT machines) to predict maintenance needs and improve uptime.
- General Electric (GE) has applied its Predix digital twin platform in healthcare settings as well – GE reports its digital twin solutions (in energy and healthcare) helped achieve a → 20% reduction in operational costs by predicting issues proactively.(2)

→ Energy & Utilities

Europe, with its focus on smart grids and renewable energy, likely contributes over \$1 billion of this. In percentage terms, energy/utilities constitute a substantial share (estimated 15–20%) of the European digital twin market in 2024.(8)

Major European Companies:

- Siemens (Germany) and Schneider Electric (France): power grids, buildings, and industrial plants
- ABB (Switzerland): power equipment and automation systems
- EDF (France) and Enel (Italy): power generation and distribution
- National Grid (UK): electricity networks
- Ørsted (Denmark): wind farms
- General Electric (GE): digital twin solutions for turbines and power infrastructure

Examples & Showcases:

- In 2025, Siemens partnered with Italian utility AcegasApsAmga to create a digital twin of Trieste's electricity grid using Gridscale X software. This digital twin enhances grid management by simulating real-time power flows, identifying overload risks, and supporting efforts in renewable integration, electrification, and decarbonization. ((9)
- In January 2024, GE launched a digital twin platform for wind farms that simulates turbine behavior to optimize performance, predict faults, and improve maintenance. European operators are using it to boost energy output and extend asset life.
- Siemens Energy uses digital twins for gas turbines and power plants across Europe – virtual models of turbines allow predictive maintenance and have been shown to cut unexpected downtime significantly (GE notes a 20% operating cost reduction globally from its twin implementations in power systems).
- Norway's oil firm Equinor uses digital twins of offshore platforms to enhance safety and efficiency.(2)

5.2 European regulations, directives, and policies that support development of Digital Twins

Public Procurement Directive (2014/24/EU)

- Allows EU countries to mandate BIM (Building Information Modeling) in public construction contracts.
- Enabled national BIM mandates from 2016 onward.

Energy Performance of Buildings Directive (EPBD, 2010/31/EU, recast 2018 & 2023–24)

- Promotes digital building logbooks, smart readiness indicators, and lifecycle energy tracking.
- 2024 revisions support digital twins to meet energy performance and renovation targets.

Corporate Sustainability Reporting Directive (CSRD, 2022 update)

- Requires large companies to report detailed building performance and carbon data, incentivizing digital twins for compliance.

Renovation Wave & Smart Readiness Indicator

- Encourage 3D modeling and digital systems in public and private building retrofits.
- Support for digital permitting and renovation passports.

→ Smart Cities & Infrastructure

Local Digital Twins EDIC (CitiVerse, launched 2023)

- Consortium of EU countries & cities to develop interoperable urban digital twins.
- Backed by €80M from Digital Europe Programme; aims for 100+ cities by 2026.

Living-in.EU & Intelligent Cities Challenge

- EU-wide programs promoting digital twins in urban planning, transport, and citizen services.

Digital Building Logbooks & Planning Platforms

- Proposed EU tools to digitally integrate public infrastructure management and planning.

→ Energy & Utilities

EU Action Plan on Digitalizing the Energy System (2022)

- Initiates a "Digital Twin of the EU Electricity Grid" to manage renewable integration and grid resilience.(10)

Destination Earth (DestinE, launched 2022)(11)

- Builds a digital twin of the Earth for climate modeling and disaster response.
- Backed by ~€150M (Digital Europe Programme) and €55M (Horizon Europe).

→ Manufacturing & Industry

New Industrial Strategy for Europe (2020/2021)

- Supports digital twin adoption for Industry 4.0 and sustainability goals.

Horizon Europe-funded projects

- Change2Twin, DIGITbrain, Twin4EU offer funding and toolkits to deploy digital twins in factories.

Digital Innovation Hubs (DIHs) under Digital Europe

- Help SMEs adopt digital twins through testbeds, training, and expert support.

→ Healthcare & Life Sciences

EDITH (2022–2025): European Virtual Human Twin initiative

- Coordinates EU research and future regulatory frameworks for digital twins in medicine.

European Health Data Space (EHDS, in development)

- Supports data infrastructure for virtual patient models and digital health twins.

→ Cross-Sector / Strategic Programs

Digital Decade Policy Programme 2030 (adopted 2022)e

- Sets EU-wide digitalization goals including deployment of digital twins in key sectors.(12)

European Green Deal & Digital Twin of the Ocean

- Promote 3D modeling and simulation tools for sustainability, climate policy, and ocean monitoring.

Horizon Europe & Digital Europe Programmes (2021–2027)

- Provide billions in funding for R&D, innovation, and infrastructure supporting digital twin development.



6. Middle East Digital Twin Market Size & Outlook 2024-2030

Market Size & Growth: The Middle East's digital twin market is expanding rapidly, driven by large-scale smart infrastructure projects and Industry 4.0 adoption. Estimates place the Middle East market at roughly \$0.7–1.0 billion in 2024. By 2030, the Middle East market is projected to reach the order of \$6 –7+ billion. This implies an exceptionally high CAGR in the range of 30–35%.

6.1 Sector-Wise Breakdown:

- **Automotive & Transport:** ~30% – the top segment by revenue, reflecting extensive use in transportation infrastructure and vehicle design.
- **Energy & Utilities:** ~20% – strong adoption in oil & gas, power generation, and utilities, in line with the region's large energy industry.
- **Manufacturing:** ~20–25% – robust use of digital twins in industrial and electronics manufacturing for process optimization.
- **Smart Infrastructure (Smart Cities & Construction):** ~15–20% – sizable uptake due to mega-projects in smart cities, construction, and real estate.
- **Healthcare:** <5% – a nascent segment (~2% of MEA market in 2024), with early pilots in hospitals and medical research.

6.2 Companies & Examples:

→ Manufacturing

Unilever:

→ Used digital twin technology on a Middle East production line to achieve 50% faster product launches and a 70% reduction in capital expenditures.

Siemens:

→ Provides digital twin platforms for virtual commissioning and automation, partnering with Middle Eastern manufacturers to optimize factory operations.

Honeywell:

→ Delivers industrial IoT and digital twin solutions to regional manufacturers for predictive maintenance and real-time performance analytics.

Schneider Electric:

→ Offers EcoStruxure™ digital twin systems to Middle Eastern factories to enhance energy efficiency, machine uptime, and operational visibility.

→ Automotive & Transport

Automotive OEMs (e.g. Turkey-based and joint ventures):

→ Use digital twins for virtual prototyping, simulation, and testing of vehicles and defense equipment.

Hamad International Airport (Qatar):

→ Deployed a digital twin to simulate passenger flow and enhance airport efficiency.

DP World (UAE):

→ Utilizes an AI-powered digital twin system (CARGOES TOS+) at Jebel Ali Port to eliminate 350,000+ unproductive container moves and reduce truck turn-around time by 20%.

→ Healthcare

Dubai Hospitals (UAE):

→ Use digital twins to optimize patient flow and rehearse complex surgeries in virtual simulations.

Dassault Systèmes:

→ Introduced the "Emma" virtual patient twin in the Middle East for medical treatment testing and personalized medicine research.

GE Healthcare, Siemens Healthineers, Philips:

→ Conduct market education and small-scale pilots of digital twin technologies in leading hospitals across the UAE and Saudi Arabia.

→ Energy & Utilities

Saudi Aramco (Saudi Arabia):

→ Develops digital twins of oil wells, refineries, and pipelines to optimize production and enable predictive maintenance.

SLB (Schlumberger), Yokogawa, Emerson:

→ Provide digital twin solutions for oilfield assets, process plants, and industrial automation in the region.

Dubai Electricity & Water Authority (DEWA):

→ Built a green data center powered by IoT and digital twins to monitor real-time power and water systems for sustainability and efficiency.

→ Smart Infrastructure (Smart Cities & Construction)

NEOM & TONOMUS (Saudi Arabia):

→ Invested \$1 billion to build a full-scale 3D digital twin metaverse of the \$500+ billion NEOM smart city for real-time planning and operations.

Smart Dubai (UAE):

→ Uses a city-wide digital twin to test urban planning scenarios for the Dubai 2040 Urban Master Plan.

Lusail City (Qatar):

→ Implements digital twin models to manage transportation, energy systems, and public utilities in real time.

Museum of the Future (UAE):

→ Used a construction-phase digital twin to detect design conflicts and reduce project costs.

Siemens:

→ Provided digital twin technology for Expo 2020 Dubai and Egypt's high-speed rail, showcasing infrastructure-scale deployments.

Bentley Systems & Autodesk:

→ Supply digital twin and BIM tools for mega construction and smart city initiatives throughout the region.

6.3 Middle East regional policies and regulations that support the development of digital twins

→ Manufacturing

UAE – Operation 300bn:

→ A national strategy to triple industrial output by 2031, prioritizing Industry 4.0 tools like digital twins, 5G, and AI to modernize UAE factories.

Saudi Arabia – Vision 2030 (Manufacturing):

→ Through initiatives like Future Factories, Saudi Arabia mandates factory digitalization, with digital twins enabling real-time monitoring and process optimization.

→ Automotive & Transport

UAE (Dubai) – RTA Digital Strategy 2023–2030:

→ Dubai's Roads & Transport Authority includes digital twin platforms in its 2030 strategy to simulate and manage smart transport systems.

UAE (Dubai) – RTA LiDAR Twin Pilot:

→ Dubai began using LiDAR-based 3D digital twins of road assets for faster, more accurate infrastructure monitoring and maintenance.

→ Healthcare

UAE – EHS Digital Twin Hospital Project:

→ Emirates Health Services launched a hospital digital twin in partnership with Schneider Electric and Microsoft to cut energy use and improve building efficiency.

Saudi Arabia – "Sehhaty" Patient Twin:

→ The Ministry of Health introduced Saudi's first AI-driven patient digital twin via the Sehhaty app, enabling personalized, predictive care aligned with Vision 2030.

→ Energy & Utilities

UAE – ADNOC Digital Twin Initiative:

→ ADNOC deployed digital twins across 2,500+ oil and gas assets to reduce maintenance costs and improve uptime through predictive AI monitoring.

UAE – DEWA Virtual Power Plant:

→ Dubai's DEWA launched a virtual power plant using a grid digital twin to optimize renewable energy coordination and support its 2050 clean energy targets.

→ Smart Infrastructure (Cities & Construction)

UAE – "Dubai Here" Digital Twin:

→ Dubai created a city-wide 3D digital twin integrating IoT and AI to support simulation of urban planning, traffic, and utility scenarios.

Saudi Arabia – Naver/NHC Smart City Twins:

→ Saudi Arabia and Naver are building high-resolution digital twins of five cities to enable real-time urban simulations as part of Vision 2030 smart city goals.



7. African Digital Twin Market Size & Outlook, 2024-2030

The total African market in 2024 is estimated to be <\$0.5 billion of which South Africa – the continent's most advanced market – generated roughly \$360 million in 2024. By 2030, Africa's digital twin market is expected to reach likely around \$2–3 billion collectively, assuming current growth trajectories. South Africa's market alone is forecast to hit \$1.78 billion by 2030. CAGR estimates for Africa are extremely high – South Africa is growing at 37.5% CAGR (2025–2030).

7.1 Sector-wise Breakdown

- **Automotive & Transport:** ~30% – the largest segment, thanks to automotive manufacturing hubs (South Africa, Morocco) and use in transport infrastructure.
- **Energy & Utilities:** ~25% – strong focus as utilities seek to improve power grids and mining/oil companies adopt digital twins for operational efficiency.
- **Manufacturing:** ~20% – driven by industrial processing and consumer goods manufacturing in economies like South Africa and Egypt.
- **Smart Infrastructure (Smart Cities & Construction):** ~15% – emerging use in new city projects and infrastructure development (notably in North Africa).
- **Healthcare:** <5% – minimal current adoption, mostly pilot projects.

7.2 Major Companies Operating in Africa

→ Global Companies:

- Siemens
- GE (General Electric)
- IBM
- Microsoft
- Schneider Electric
- Emerson
- SLB (Schlumberger)
 - Implements digital twins in oilfield services, drilling platforms, and production monitoring.
- Yokogawa
 - Provides operational twins for industrial and energy process optimization.
- AVEVA (OSIsoft)
 - Powers real-time data integration and digital twin modeling for utilities and heavy industry.
- Autodesk
- Bentley Systems
- Thales
 - Delivers digital twin-powered rail signaling systems in transport infrastructure projects.
- Alstom
 - Provides transport-oriented digital twin tools, especially for high-speed and urban rail.

→ Regional & Local Companies

Aveng (South Africa):

- Uses BIM-integrated digital twins in construction and infrastructure projects.

Orascom Construction (Egypt):

- Applies digital twin technologies in large-scale infrastructure builds.

Smart City Authorities (e.g., Konza Technopolis (Kenya), Kigali Innovation City (Rwanda), New Administrative Capital (Egypt)):

- Use or pilot digital twin platforms for urban planning and smart infrastructure.

Local GIS and 3D modeling startups :

- In countries like Nigeria, South Africa, and Kenya, several emerging firms specialize in spatial data integration and twin-ready infrastructure mapping (names often project-specific).

Telecom & ICT Providers:

- National telecoms and system integrators in countries like South Africa, Morocco, and Egypt often act as digital twin enablers by supplying IoT infrastructure and dashboards.

7.3 Companies & Showcases:

→ Automotive & Transport

Siemens:

→ Used digital twin technology to plan and manage Egypt's high-speed railway project, enabling simulation of rail operations and construction phasing.

South African Car Manufacturers (BMW, Ford, Nissan):

→ Utilize digital twins to virtually design and optimize vehicle assembly lines for precision and efficiency.

Durban Port & Mombasa Port Authorities:

→ Explored digital twin solutions to streamline container logistics and predict operational bottlenecks.

Nairobi & Kigali Smart City Authorities:

→ Initiated digital twin pilot programs for traffic signal optimization and urban congestion management.

Thales & Alstom:

→ Provide digital twin-based rail signaling systems in African transit and high-speed rail projects.

→ Healthcare

Private Hospitals in South Africa:

→ Piloted digital twins of hospital wards to simulate patient flow and improve staff allocation.

South African Universities:

→ Developed a cardiac digital twin prototype to study heart disease progression in academic research.

Twin Health:

→ Entered emerging African markets with a digital twin-based diabetes management platform.

Phillips & Siemens Healthineers:

→ Conducted small-scale pilots of digital twin technology for hospital operations and medical device testing.

Tunisia & Egypt Health Ministries:

→ Considered national-scale digital twins of healthcare infrastructure for resource planning (preliminary stage).

→ Energy & Utilities – Companies & Examples

Eskom (South Africa):

→ Developed digital twins of power plant turbines and transformers to enhance grid reliability through predictive maintenance.

Anglo American:

→ Uses digital twins to optimize mineral processing and improve safety across African mining operations.

Cullinan Diamond Mine (South Africa):

→ Implemented a digital twin of ore crushers to fine-tune performance and extend equipment life.

Sonatrach (Algeria) & Offshore Producers (Nigeria, Angola):

→ Adopt digital twin systems to remotely monitor wells, pipelines, and LNG plants.

GE, ABB, Emerson, OSIsoft/AVEVA:

→ Provide digital twin solutions for African utilities, refineries, and renewable energy projects.

→ Smart Infrastructure

Egypt's New Administrative Capital (NAC):

→ Uses a full-scale urban digital twin to simulate traffic, utilities, and emergency services before citizen occupation.

Kigali Smart City (Rwanda):

→ Partnered with tech firms to deploy a digital twin integrating 3D data and IoT sensors for traffic and flood management.

Konza Technopolis (Kenya):

→ Built a digital twin platform to visualize infrastructure development and plan smart city services in real time.

Orascom (Egypt) & Aveng (South Africa):

→ Use BIM-integrated digital twin systems to monitor construction quality and building lifecycle performance.

Bentley Systems & Autodesk:

→ Supply core digital twin software for African construction and smart city projects.

Huawei:

→ Provides city-scale IoT platforms across Africa that feed real-time data into digital twin systems

Siemens:

→ Enables African smart cities through its Xcelerator suite and digital twin-powered city management tools.

7.4 African regional policies and regulations that support the development of digital twins

→ Manufacturing

South Africa – Presidential Commission on the Fourth Industrial Revolution (2019):

→ *Established a national body to steer Industry 4.0 technologies (including digital twins) to modernize manufacturing processes and build local digital capabilities.*

→ Automotive & Transport

Smart Africa Alliance (2019):

→ *A regional partnership (including African Union, ITU, World Bank) that promotes smart city and transport innovation using ICT infrastructure and future-ready platforms like digital twins.*

City-level pilots in mobility:

→ *Emerging digital twin projects for transport in rapidly urbanizing cities (e.g. Nairobi, Accra) have been supported through multi-city smart city policy frameworks.*

→ Healthcare

Academic & pilot guidelines for virtual patients:

→ *Thought leadership emphasizes developing ethical frameworks and legal standards for healthcare twins, urging governments to prioritize regulation and capacity building.*

African Medicines Agency (AMA, 2021):

→ *While not directly about digital twins, the AMA facilitates harmonized regulation across Africa, creating an environment conducive to innovation in digital health and infrastructure.*

→ Energy & Utilities

PRIDA (EU–AU partnership):

→ *Designed to expand broadband and harmonize ICT regulations across Africa, enabling digital infrastructure essential for real-world digital twin applications in energy and utilities.*

ITU's U4SSC guidelines (2025):

→ *Provide policy frameworks for smart sustainable cities, including technical specifications for digital twin deployment in urban utility networks.*

→ Smart Infrastructure (Cities & Construction)

Smart Africa Alliance – Smart City Manifesto:

→ *Drives adoption of urban digital solutions (like digital twins and IoT), empowering city leaders across member states to invest in 3D modeling and planning.*

Urban planning pilots (Ghana, Accra): :

→ *Research-stage digital twins for low-income communities — such as the Tetegu digital twin used to model flood mitigation and resource allocation — supported by national urban policy experimentation.*



Harness the Power of Digital Twins

The Digital Twin revolution is reshaping industries across Europe, the Middle East, and Africa—transforming how organizations design, operate, and optimize everything from factories to cities, power grids to healthcare systems. At WorkNomads, we combine deep engineering expertise with a global, cross-disciplinary talent network to guide businesses through every step of their Industry 4.0 journey.

When implemented correctly, Digital Twins give you the predictive insight to avoid costly strategic mistakes. Even before reaching a full Digital Twin, there are powerful steps you can take to optimize production and increase efficiency.

Book a discovery call with us to explore our Industry 4.0 approach - designed to be implemented at scale and tailored to your specific business goals. Let's create a roadmap that connects innovation with measurable results.

→ Book a suitable time for a discovery call

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