

공급 구제를 위한 스마트 공장



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세계경제가 최악의 코로나 19 대유행 국면에서 회복되면서 노동력 부족과 공급망 병목현상이 제조업체의 발목을 잡고 있습니다.

다행히도 안도할 수 있는 측면이 있습니다. 디지털화가 제조공장 전반에 적용되면서 현재 활기 없는 공장을 미래의 스마트 공장으로 변화시키고 있습니다. 기하급수적인 컴퓨터 성능, 빅데이터, 인공지능(AI), 머신러닝(ML)과 같이 4차 산업혁명을 주도하는 여러 기술 요소가 촉매제가 되고 있습니다. 미래 공장은 점점 더 자율적이고 스스로 최적화되며 지속가능해질 것입니다.

S&P Kensho Smart Factories 지수는 이러한 제조혁명을 가능하게 하는 회사를 추적하고자 합니다. 이 지수에는 다음 4가지 핵심기술에 중점을 둔 전체 혁신 생태계의 기업이 포함됩니다.

- **디지털 제조 솔루션(지수 가중치의 52.6%¹):** 환경 감지 및 모니터링, 고급 프로세스 제어, 예측 유지보수에 사용되는 장비를 포함하여 제조활동의 연결되고 통합 디지털화를 가능하게 하는 소프트웨어를 다룹니다. 클라우드 채택으로 인해 원격기능을 갖춘 디지털 전환은 있으면 좋은 것에서 꼭 있어야 하는 것으로 바뀌었습니다.
 - 인텔 연구 보고서²에 따르면, 제조업체는 연간 최대 800 시간의 미예정 가동중단 시간(이 중 30%는 계획되지 않음)을 경험하고 숙련 작업자는 고령화되어 200만 개 일자리가 채워지지 않을 위험에 처해 있습니다.
 - 비용 절감 및 폐기물 감소는 채택의 또 다른 촉매제입니다. 맥킨지 연구³에 따르면 AI로 강화된 산업용 장비의 예측 유지보수는 연간 유지보수 비용을 10%, 가동중단 시간을 최대 20%, 검사 비용을 25% 줄일 수 있습니다.
- **산업용 사물 인터넷(IIoT)(지수 가중치의 22.9%):** 컴퓨터의 산업용 애플리케이션과 함께 네트워크로 연결된 크고 어디에나 있는 데이터, 센서, 기기, 기타 장치의 상호 연결을 나타냅니다. 제조업체가 산업 활동을 연결, 자동화, 추적 및 분석할 수 있도록 하는 것이 중요합니다.

IIoT는 실시간 자산 성과 모니터링 솔루션을 제공하여 운영자와 감독자가 전세계 어디에서나 연결된 장치를 통해 추세를 그래픽으로 시각화할 수 있도록 지원합니다.

- **산업용 기계 비전(지수 가중치의 17.2%):** 센서, 카메라, 컴퓨터, ML/AI 를 시각적 데이터와 결합하여 제품 결함을 식별하고 장비 공정 및 제품 결과를 모델링하고 예측하는 기술을 포함합니다.
- **디지털 트윈 기술(지수 가중치의 7.3%):** 모든 물리적 제품, 장비 또는 자산의 가상 복제본을 제공합니다. 예를 들어, 디지털 트윈은 제조된 제품, 전체 생산 라인, 전체 공장, 공장 네트워크의 가상 버전이 될 수 있습니다.

디지털 트윈에서 큰 결과가 기대됩니다. Gartner⁴ 는 업체들은 디지털 트윈을 사용하면 유지보수 비용을 연간 1 조 달러 절감할 수 있을 것으로 전망하고 있습니다.

도표 1 에서 각 핵심기술에 대한 5 년 미래성장 전망⁵ 과 각 부문 기업들의 2021 년 성과를 볼 수 있습니다.

KEY TECHNOLOGY	FIVE-YEAR GROWTH FORECAST	2021 CALENDAR YEAR MARKET PERFORMANCE (%)
Digital Manufacturing Solutions	Valued at USD 263.93 billion in 2020 Expected to reach USD 767.82 billion by 2026 and work at a CAGR of 19.48% over the forecast period 2021-2026	48.95
IIoT	Expected to grow from USD 76.7 billion in 2021 to USD 106.1 billion by 2026	19.25
Industrial Machine Vision	Expected to grow at a CAGR of 7% through 2026, driven in large part by industrial applications	30.86
Digital Twins Technology	Expected to work at a CAGR of 35% over the 2021-2026 forecast period	25.43

Source: S&P Dow Jones Indices LLC, FactSet. Data as of Dec. 31, 2021. 2021 market performance is based on the scaled weighted average of the performance of the index constituents focused on each technology. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. The S&P Kensho Smart Factories Index was launched Sept. 16, 2021.

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PERIOD	RETURN (%)		
	S&P KENSHO SMART FACTORIES INDEX	S&P 500 CAPITAL GOODS INDEX	S&P 500 INDUSTRIALS
Calendar Year 2021	32.27	18.95	21.12
3-Year	28.75	18.48	20.28
Since Inception	19.20	10.44	12.30

Source: S&P Dow Jones Indices LLC. Data from May 15, 2017, to Dec. 31, 2021. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. The S&P Kensho Smart Factories Index was launched Sept. 16, 2021.

¹ 2021년 12월 31일 현재. 지수 가중치 총합은 기업의 제품 부문 매핑에 기반합니다.

² 인텔 리서치. https://s21.q4cdn.com/600692695/files/doc_downloads/intelligent-factory-infographic.pdf

³ 맥킨지

리서치. <https://www.mckinsey.com/~media/mckinsey/industries/semiconductors/our%20insights/smartening%20up%20with%20artificial%20intelligence/smartening-up-with-artificial-intelligence.ashx>

⁴ Gartner 디지털 트윈 전망. https://www.ey.com/en_au/advanced-manufacturing/how-digital-twins-give-automotive-companies-a-real-world-advantage

⁵ 디지털 제조 솔루션 성장. <https://www.mordorintelligence.com/industry-reports/digital-transformation-market-in-manufacturing>

IIoT 시장 전망. <https://www.prnewswire.com/news-releases/industrial-iiot-market-worth-106-1-billion-by-2026-exclusive-report-by-marketsandmarkets-301325443.html>

산업용 기계 비전 CAGR. <https://www.marketsandmarkets.com/PressReleases/industrial-machine-vision.asp>

디지털 트윈 CAGR. <https://www.mobinius.com/blogs/digital-twin-trends/>

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