



## Improve The Way You Build to Build a Better World

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### Construction 4.0 Didn't Work: We Need to Implement Construction 5.0

The industrial revolution began in the late 1700s. Prior to this period, manufacturing capacity relied heavily on manpower and manual skill. The industrial revolution granted entrepreneurs the opportunity for mass and standardized production. Throughout Industry 1.0, 2.0, 3.0, and even 4.0, the central questions revolved around how to increase efficiency, enhance quality, reduce costs, and most importantly, decrease dependence on human labor. However, despite high expectations, Industry 4.0 failed to shield companies from severe crises. For the first time, an industrial movement had to place human beings at its core with the advent of Industry 5.0.

The construction industry faces greater challenges than other sectors that have embraced Industry 4.0, largely due to years of underinvestment in both systems and skilled talent, which has hindered the widespread adoption of Construction 4.0. Meanwhile, as we navigate a global revolution affecting every facet of life, mere efficiency is no longer enough. We must fundamentally rethink construction practices—prioritizing human well-being and environmental sustainability—while leveraging the transformative power of technology.

### What is Construction 5.0?



Construction 5.0 represents a paradigm shift that merges technology with human creativity to tackle contemporary challenges in construction, while promoting sustainability and resilience throughout the industry. Unlike Construction 4.0, its guiding principle is technology *for* humans, not *instead of* humans. Most sources describe it as aligned with the United Nations Sustainable Development Goals and the Paris Agreement, prioritizing employee well-being and integrating advanced technologies such as AI, IoT, robotics, and collaborative robots (cobots).



The construction sector plays a crucial role, both directly and indirectly, in achieving sustainable development goals. Therefore, any progress in the industry's performance is highly significant. Indeed, without advancements in construction, the Sustainable Development Goals cannot be realized.

### Construction Sector's Contribution to Sustainable Development Goals

The construction industry significantly contributes to sustainable development by creating jobs, improving infrastructure, and enhancing well-being. It supports clean water and sanitation, reduces energy consumption, and stimulates economic growth. Additionally, it plays a vital role in climate change mitigation.

## SUSTAINABLE DEVELOPMENT GOALS



Here is how the construction sector contributes to individual goals:



**End poverty in all its forms everywhere:** The construction sector provides numerous blue- and white-collar jobs for both men and women. It enables workers to learn and develop skills on-site. Offering global job opportunities with accommodation allows people from emerging countries to earn income and support their families.



**Ensure healthy lives and promote well-being for all at all ages:** Humans require built environments and infrastructure to meet vital needs. Well-designed and constructed buildings and infrastructure enhance the health and well-being of communities.



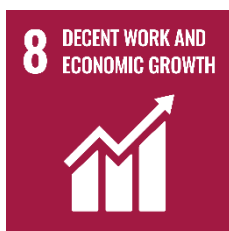
**Achieve gender equality and empower all women and girls:** Companies in the sector offer employment opportunities that are not gender-dependent, especially in white-collar roles. Technological advancements are expected to reduce reliance on physical strength, increasing job availability for women. Greater diversity will also boost the sector's innovation capacity.



**Ensure availability and sustainable management of water and sanitation for all:** Infrastructure delivery is directly linked to providing clean water and sanitation. Innovations in construction will improve the supply and delivery of these services. Furthermore, water treatment systems for sewage reuse are essential for built environments.



**Ensure access to affordable, reliable, sustainable, and modern energy for all:** Improvements in construction will facilitate better development of energy plants and distribution networks. Well-designed buildings will also reduce energy consumption.



**Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all:** The construction industry contributes approximately 5–6% to global GDP, with projections to increase to about 14.7% by 2030. Enhancing the resilience and agility of construction companies will foster quality employment and stimulate global economic growth. Cobots will improve working conditions and increase workers' earnings.



**Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation:** The construction industry involves numerous vendors. Collaboration among parties and other industries will unleash innovation and productivity through collective intelligence.



**Make cities and human settlements inclusive, safe, resilient, and sustainable:** Building sustainable, resilient cities is the construction industry's core mission. Any improvements contribute to creating sustainable cities, which in turn foster resilient societies.



**Ensure sustainable consumption and production patterns:** The construction sector is a major consumer of raw materials, and demolition generates significant waste. Designing and building resilient, long-lasting projects is vital for planetary sustainability. Focus on upcycling and eco-friendly materials is also essential.



**Take urgent action to combat climate change and its impacts:** The buildings and construction sector, along with its supply chain, significantly impacts climate change. Advancements in this area will positively affect the environment.



**Conserve and sustainably use oceans, seas, and marine resources for sustainable development:** Marine structures and the effects of excavation and demolition waste impact underwater ecosystems. So, we need deep consideration on this subject.



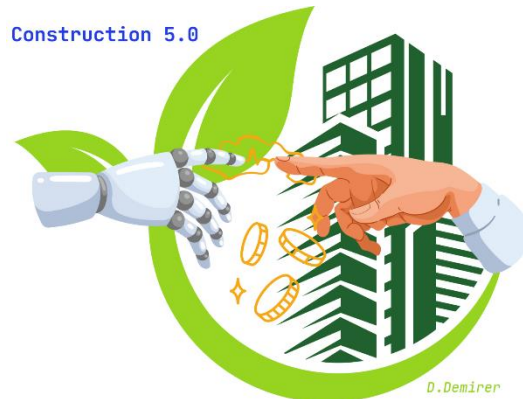
**Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss:** The built environment directly affects terrestrial life, necessitating careful planning, construction, and demolition.



**Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development:** Through international engineering and contracting services, the construction sector strongly supports the Sustainable Development Goals.



We could write extensively on how the construction sector contributes to each goal.



However, all these can be summarized into four key themes:

- **Sustainability:** Emphasizing eco-friendly methods, materials, and energy-efficient designs to minimize waste and reduce carbon footprint.
- **Human-Centricity:** Prioritizing human well-being and societal goals, leveraging technology to enhance productivity and safety.
- **Digitalization:** Integrating digital tools and technologies to optimize resource use, improve efficiency, and enhance working conditions.
- **Resilience:** Developing the ability to adapt to market dynamics and environmental challenges with agility. The sustainable profitability of companies.

In short, Construction 5.0 encourages us to improve how we build to build a better world.

The industry faces several challenges to adopt Construction 5.0, such as:

- Lack of technological proficiency;
- Poor collaboration and transparency;
- Weak trust and relationships due to project-based organizational structures;
- Insufficient innovation and improvement;
- Talent shortages, as younger generations are reluctant to join, and older workers seek to leave.

While the United Nations Sustainable Development Goals indicate areas for development, they do not prescribe how to achieve them. Here, management and transformation models from agile companies can provide guidance.

Since the early 2000s, digital product companies have adopted a human-centric business approach called “Agile.” They focus on customer experience and expectations, delivering products incrementally to gather feedback and continuously improve. Agile companies thrive in volatile, uncertain, complex, and ambiguous (VUCA) environments through continuous innovation. Unlike traditional companies that aim to reduce human involvement, agile firms engage their people to unleash innovation potential. They replace hierarchical, siloed organizations with collaborative thinking to harness collective intelligence. Autonomy and accountability for products and customer satisfaction are



encouraged. Prioritizing moral values and autonomy fosters employee engagement and customer loyalty, explaining digital companies' rapid growth over the past 25 years.

Fortunately, technological tools now enhance transparency and collaboration. It is time to invest in people's welfare and develop new generational capabilities. Achieving autonomy and accountability requires significant investment in mindset, people, and systems. When the construction industry becomes an effective technology consumer, new technologies will emerge to further improve work methods, creating mutual development.

The industry lags behind others, has limited time to meet the Sustainable Development Goals, and cannot afford financial waste. Therefore, urgent investment and transformation are necessary, but progress requires patience. We cannot transform at once by employing all technologies and methods at once. A steady transformation begins with small steps, progressing through experimentation and evaluation within autonomous frameworks. And the correct first step changes from company to company, the question is it must be decided with collective intelligence.

Let's start with the easiest step for your company and see what happens.