

2023 Industry --- Outlook



COVENANTZ
INTELLIGENT COVENANT MANAGEMENT

Covenantz Industry Outlook 2023

*"A digital ecosystem is focusing on bringing extra value to customers by optimizing data and workflows from different internal departments, tools, systems, customers, suppliers, and external partners. It should remove obstacles from the customer journey and enable every participant in the ecosystem to use state-of-the-art systems to fulfill their individual needs."*¹ --More Than Digital

Numerous reputable consultancies are now reporting on the importance of the **Built Environment Ecosystem**, which is the foundation of Covenantz, its mission, vision, and values.

Covenantz' Industry Outlook 2023 presents its assessment of *Built Environment Ecosystem* opportunities – not company or sub-optimized industry-level solutions as numerous technology and advisory services have provided to date and upon which they continue to rely. Covenantz provides the Built Environment with a holistic and fully integrated *ecosystem* solution to problems that have plagued the industry for decades.

Covenantz's lead platform, KiRegistry.org, is the integrator for the Built Environment Ecosystem and its adjacent categories. KiRegistry derives its name from "Ki" for earth or life energy and "registry" for a place where records are kept. KiRegistry defines an **ecosystem** as *"a network of interconnected digital technologies, platforms, and services composed of software, hardware, data, and people, which work together to facilitate digital transactions, communication, and collaboration to create value for businesses and consumers."*²

The KiRegistry ecosystem was designed by AEC industry leaders as a fair and equitable solution for all stakeholders to benefit and grow a healthier and more profitable future.

The Industry Problem

Nearly all Built Environment problems point back to fragmented and siloed practices that impede communication, collaboration, and transparency and lead to a construction dispute quagmire. The Built Environment, generally understood to include architects, engineers, contractors (AEC), finance, insurance, manufacturing, and government regulation, is on the precipice of significant digital transformation – what many call the Fourth Industrial Revolution (4IR).

OVERVIEW

What is the current state of the Built Environment?

The Built Environment is a large complex industry in decline despite efforts to improve productivity and profitability, adapt to regulations, retain skilled labor, and integrate silos and data.

What are the barriers to digital transformation?

Industry fragmentation. Silos and dysfunctional supply chains. Increased lead times and inflated material costs put pressure on margins. Lack of skilled labor. Low margins, plus inflation. Data and cyber security. Adoption and scaling challenges for older entrenched legacy systems.

What are the top solutions?

Investors are looking for AEC technology companies pursuing a big total addressable market (TAM) and bold vision to create a seamless user experience and unlock newfound value for a broad set of customers. Platforms with expanded core offerings beyond architects and engineers, who connect to suppliers, project owners, banks, and insurance will improve project outcomes' predictability and net customer retention.

How does Covenantz deliver?

Covenantz created an integrated Built Environment Ecosystem platform called KiRegistry that saves time and money with seamless integration for labor resources, AEC, finance, insurance, government, and manufacturing. Covenantz is pursuing the \$12 trillion global construction TAM with a vision to change the way the world builds.

¹ Talin, B. (2023). What is a digital ecosystem? – Understanding the most profitable business model. *MoreThanDigital*

² Ibid.

Experts in the field have written and continue to opine how the analog fragmented AEC industry struggles to adapt to increasing demands for digitization, efficiency, and carbon management; at the same time, productivity has declined for more than 60 years.³

*"...Measures of labor and total factor productivity (TFP) in the sector have trended downward. To be clear, the raw BEA data suggest that the sector has become less productive over time. A lot less productive: value added per worker in the sector was about 40 percent lower in 2020 than it was in 1970."*⁴ -- BFI

McKinsey observed the challenges and potential, imagining a new *"digital future in construction"* in a 2016 report. They describe how large projects are often more than 20% over schedule and 80% over budget while confirming that productivity has declined and profits for construction firms are thin and often volatile.⁵ In addition, they identified the growing demand for environmentally responsible practices, shortages in skilled labor, and the urgent need to find seamless solutions that would be realistic in the field.

While there are category leaders and billions of venture capital dollars flowing, few technology companies have emerged as the "leveraging conveners" that companies like Deloitte point to as necessary *integrators* for fundamental digital transformation and improved return on investment (ROI) to capital and stakeholders.

Industry demand for a holistic *cloud-based ecosystem platform* that provides risk mitigation and grows broad asset classes has never been higher. The big consultancies' and technology providers' focus is on modernizing, simplifying, and streamlining complex real-world legacy industries. Their clients are both eager and perplexed about how to adapt and thrive in an ever-evolving technology landscape with increasing demands on their services outside their traditional modes of operation, particularly given budgetary constraints and environmental objectives – all the while seeking data-informed investment decisions to shed the balance sheet burden or decommission legacy investments.

Rather than invest time and capital in training or "rewiring" company operational processes, the best solution connects stakeholders across sectors and skill levels with a simple, easy-to-implement, secure interface that enables better KPIs⁶ with validated APIs.⁷ A single platform integrating sensitive data in a mutually beneficial collaborative ecosystem could reverse the decades-long decline in construction and the Built Environment.

Covenantz provides the Built Environment Ecosystem solution.

What is the current state of the Built Environment?

MARKET DEMANDS

*"A digital transformation is the process of developing organizational and technology-based capabilities that allow a company to continuously improve its customer experience and lower its unit cost; and over time sustain a competitive advantage."*⁸ -- Rewired

³ Becker Friedman Institute for Economics at UChicago. (2023, January 19). *The Strange and Awful Path of Productivity in the U.S. Construction Sector* | BFI.

⁴ *Ibid.*

⁵ *Imagining construction's digital future.* (2016, August 9). McKinsey & Company.

⁶ Twin, A. (2023). *Key Performance Indicator (KPI): Definition, Types, and Examples.* Investopedia. <https://www.investopedia.com/terms/k/kpi.asp>

⁷ What is an Application Programming Interface (API)? | IBM. (n.d.). <https://www.ibm.com/topics/api>

⁸ Lamarre, E., Smaje, K., & Zimmel, R. (2023). *Rewired: The McKinsey Guide to Outcompeting in the Age of Digital and AI.* John Wiley & Sons.

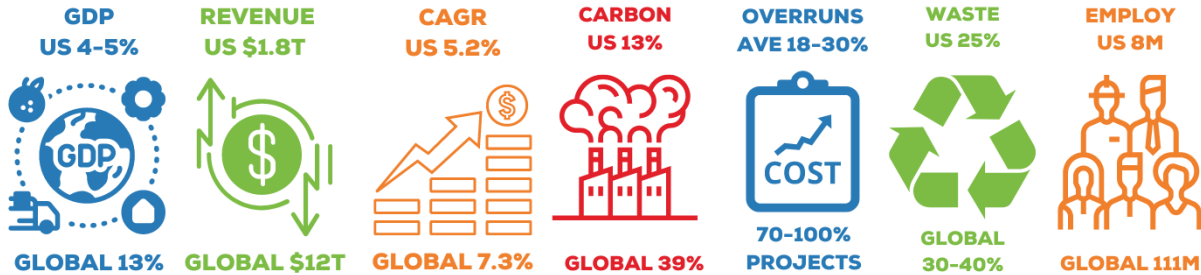
Advisory firms urge industry leaders to step forward to harness the first-mover advantage and the many downstream benefits promised by the evolving landscape of technology. However, the Built Environment is notoriously lagging in technology fluidity and cross-project delivery integration or capital margins to chase experimental prototypes. Industry behaviors and norms are culturally entrenched, which creates a significant inertial effect on change. McKinsey recently published *Rewired*, a playbook for organizations to adapt and respond to the digital and AI revolution, which is answering long overdue questions about how to implement the changes necessary to survive and thrive in the next industrial era. Some of their recommendations include developing digital talent in-house, rearchitecting organizations to pivot faster, empowering digital innovation, and taking advantage of data-rich environments.

Other advisors also report increased demand for practical tools and maps for transforming laggardly businesses into tech-savvy players of tomorrow. The pressure to change is tremendous, and so is the financial incentive.

RECORD INVESTMENTS

Record investments in the Built Environment are pushing the needle in technology development. In its 2023 Private Equity survey, McKinsey notes that global investment in architecture, engineering, and construction (AEC) tech grew to \$50 billion between 2020 and 2022 and is expected to continue to increase. According to this survey, the top demand for AEC technology comes from several key areas. Investor optimism is high and only growing. However, solutions remain niche-oriented and siloed. Will there be a broader impact played by key stakeholders throughout the Ecosystem? Expectations for growth are triggering more innovation as the technology environment continues to merge and converge.

CONSTRUCTION QUICK STATS



INFRASTRUCTURE SPENDING & REGULATION

The United States passed an infrastructure spending package of \$1.2 trillion, and the Next Generation European Union fund will spend €800 billion in Europe.⁹ Many companies are looking to tap into this money stream, and all will be expected to implement technology to improve financial performance outcomes and mitigate carbon impacts aligned with domestic and established geo-objective agreements. Meanwhile, government oversight and regulations related to Environmental, Social, and Governance (ESG) and Greenhouse Gas (GHG) are expected to increase.¹⁰ Ernst & Young (EY) recommend integrating sustainability into the business model.¹¹ A Price Waterhouse Coopers' (PwC) survey reports 60% of executives believe ESG and sustainability planning are integral and necessary while transforming GHG reduction capabilities.¹² Deloitte finds that

⁹ From start-up to scale-up: Accelerating growth in construction technology. (2023, May 3). McKinsey & Company.
¹⁰ From start-up to scale-up: Accelerating growth in construction technology. (2023, May 3). McKinsey & Company.
¹¹ Schäfer, A., & Zuberer, J. (2021). How to build (in) the future. www.ey.com. https://www.ey.com/en_it/strategy/how-to-build-in-the-future
¹² PricewaterhouseCoopers. (n.d.). Next in: engineering and construction industry trends. PwC

construction companies lack visibility in their subcontracting processes to make effective carbon mitigation choices:

*"As a result, the sector is likely to focus on technology because digitalization plays a key role in enabling energy efficiency and demand flexibility in facilities and buildings. For instance, technologies such as big data and AI/machine learning can help companies track their overall carbon footprint."*¹³ --Deloitte

Advanced technology is increasingly necessary to actively manage labor resources, material shortages, and quantification and delivery of carbon objectives at the corporate and government levels.¹⁴ Expect to see more developers and regulators collaborating to bring value to the industry through evolving signals and incentives.

INTEROPERABILITY

Companies and their customers seek interoperability within their internal and external business processes.¹⁵ They don't want a dozen or more apps running separately on any platform, nor do they have the extra time to conduct due diligence before investing and adopting new platforms. They want to see their critical operating and decision-informing data in one place, working seamlessly within their existing business model. Deloitte reports that their clients struggled to realize the total value of cloud-based platforms *"because parts of legacy technology and non-cloud native applications remain in place, creating a hybrid operating system inhibiting interoperability."*¹⁶ 85% of Deloitte's surveyed executives believe production ecosystems are important or extremely important to the competitiveness of their business.¹⁷

*"Owners are by far the most likely to believe in the future importance of these workflows. This suggests that owners will be able to drive the digital transformation of the different project players."*¹⁸ --Dodge Construction

EY found, *"Today's end customers want an experience that is holistic, digitally enabled, and considers the total cost of ownership."*¹⁹ PwC recommends that its clients look for partners offering *"new digital services"* to help them achieve their ESG and GHG goals.²⁰ Autodesk Digital Builder survey said, *"Construction tech will continue to rapidly disrupt the industry with a focus on the connected job site and leveraging data collection and interconnectivity to increase productivity, quality, and safety."*²¹ Dodge Construction Network did a survey that confirmed connected, digital workflows will only become more critical in the next five years. They claim the top obstacle for capital stakeholders is *"not enough priority to require it contractually."*²²

DATA SOVEREIGNTY & MONETIZATION

*"The most significant trend will continue to be a digital overhaul of the construction landscape. Value is going to live inside of data more than it ever has before. If you can collect, analyze, and validate data, you will become one of the most valuable members of the industry for the next decade."*²³ --Digital Builder

¹³ *Engineering and construction industry playbook.* (n.d.). Deloitte United States.

¹⁴ *Engineering and construction industry playbook.* (n.d.). Deloitte United States.

¹⁵ *From start-up to scale-up: Accelerating growth in construction technology.* (2023, May 3). McKinsey & Company.

¹⁶ Agnew, D. (2022, November 15). *What Awaits Commercial Insurance in 2023? This New Deloitte Report Looks Ahead.* Risk & Insurance.

¹⁷ *Accelerating smart manufacturing.* (n.d.). Deloitte Insights.

¹⁸ Dodge Construction Network. (2023, May 30). *Connected Construction SmartMarket Brief* | Dodge Construction Network.

¹⁹ Schäfer, A., & Zuberer, J. (2021). *How to build (in) the future.* www.ey.com. https://www.ey.com/en_it/strategy/how-to-build-in-the-future

²⁰ PricewaterhouseCoopers. (n.d.). *Next in: engineering and construction industry trends.* PwC

²¹ Ellis, G. (2023). *2023 Construction Trends: 23+ Experts Share Insight.* Digital Builder.

²² Dodge Construction Network. (2023, May 30). *Connected Construction SmartMarket Brief* | Dodge Construction Network.

²³ Ellis, G. (2023). *2023 Construction Trends: 23+ Experts Share Insight.* Digital Builder.

There is tremendous pressure for data sovereignty, monetization, and security for all large-scale projects. Data sovereignty is the practice of data being governed and secured in the country it was collected, not transferred elsewhere or harnessed by third parties without consent. It ensures that cyber criminals don't easily abuse sensitive data, like personal information or trade secrets. It helps businesses access their data during a disaster or disruption. It protects individuals' or entities' data from outside interference or access.²⁴ Data sovereignty can include data security, cloud computing, network sovereignty, and technological sovereignty.²⁵

The EU's General Data Protection Regulation (GDPR) created a legal boundary to protect citizens/entities' data integrity and ownership. There are now 157 countries that have some form of data privacy laws.²⁶ International sovereignty laws will continue to evolve, which allows project owners to take control of a rich source of information and asset value.

*"Many carriers still too often treat data as an infrastructure expense to be managed, rather than a strategic asset that can help them learn more about customer needs and preferences in terms of products and services."*²⁷ --Deloitte

Most people now understand that *data is the new oil*, yet few can integrate and monetize it into their business functions. Trimble says 95.5% of all data captured goes **unused** in the Engineering and Construction industry.²⁸ KPMG points out that most AEC and E&C companies have not figured out how to use their data well.²⁹

Deloitte suggests that *sovereign industry clouds "can hypercharge an organization's capacity to change. Their preconfigured capabilities kick-start the digital build, and continuous innovation-led investment from ecosystem partners allow users to achieve greater nimbleness, scalability, stability, and optionality."*³⁰

More than half of Deloitte's survey respondents are very concerned about their data security, which includes protecting IP and credibility throughout the value chain. Tapping into a secure and robust network to protect and monetize company data will be an operational necessity and critical competitive advantage.

While these current pressure points fuel a desire for digital transformation, age-old barriers cause latency, productivity decline, and underutilization of financial resources and associated ROI.

What are the barriers to digital transformation?

FRAGMENTATION

*"Construction is an industry with a fragmented value chain that makes change more challenging."*³¹ -- Ernst & Young

Fragmentation, opaque silo operation, and dysfunctional supply chains are all part of the same isolationist (perhaps protectionist) dynamic within the Built Environment. Fragmentation is a function of distinct specialty divisions that tend to operate in silos with limited visibility into other silos. This impacts signals throughout the supply chain and *"boots-on-the-ground"* delivery systems and processes. The average project involves 100-600 suppliers and subcontractors, all with their

²⁴ Freestone, T., & Freestone, T. (2023). *Data Sovereignty and GDPR [Understanding Data Security]*. Kiteworks | Your Private Content Network.

²⁵ Wikipedia contributors. (2023a). *Data sovereignty*. Wikipedia. https://en.wikipedia.org/wiki/Data_sovereignty

²⁶ Kwong, S. (2023). *Stay in Control of Your Data with a Secure and Compliant Sovereign Cloud*. CIO.

²⁷ Agnew, D. (2022, November 15). *What Awaits Commercial Insurance in 2023? This New Deloitte Report Looks Ahead*. Risk & Insurance.

²⁸ *Connected Construction: A new technology mindset for a new era*. (n.d.). <https://get.trimble.com/cons-global-data-report.html>

²⁹ Armstrong, G. (n.d.). *Construction in 2030*. KPMG. <https://kpmg.com/xx/en/home/industries/infrastructure/construction-2030.html>

³⁰ Agnew, D. (2022, November 15). *What Awaits Commercial Insurance in 2023? This New Deloitte Report Looks Ahead*. Risk & Insurance.

³¹ Schäfer, A., & Zuberer, J. (2021). *How to build (in) the future*. [www.ey.com. https://www.ey.com/en_it/strategy/how-to-build-in-the-future](https://www.ey.com/en_it/strategy/how-to-build-in-the-future)

techniques and methods of managing data, work product, regulations, compliance, and delivery. Part of the fragmentation is due to the "risk-averse" nature of the industry.³² The industry's "rising needs to comply with environmental sustainability, industrialization, commodification, and pricing pressure" creates an urgent need to transcend the fragmented value chain to mitigate risks and not exacerbate them.³³

SUPPLY CHAIN

The supply chain continues to be a source of concern, highlighted by the impacts and lessons learned from the pandemic. Supply chain logistics, supplier, and sub-supplier data have never been more critical to successful Built Environment projects, health care, and countless other industries. The Built Environment faces increased lead times and inflated material costs that pressure margins, absent more effective supplier information and data integration, analytics, and data-informed decisions. According to Trimble, *"Supply chain issues have also been a challenge in North America, where in the United States construction input prices have jumped 41% since February 2020."*³⁴

SKILLED LABOR SHORTAGES

Another often-cited barrier is the ongoing shortage of skilled labor. There are roughly 440,000 openings in the US construction market and 300,000 in the UK.³⁵ According to the Bureau of Labor and Statistics, nearly half of the workers are over 45, and essential knowledge is often lost as older experienced workers retire.³⁶ According to a survey in Digital Builder, *"Digital upskilling and training for a specific technology, as well as a broader focus on knowledge sharing, is critical to capture institutional knowledge and IP that is leaving the business due to retirement."*³⁷

*"A smaller talent pool has forced some contractors to turn down work on new projects, said Kris Manning, chief operating officer of Bethesda, Maryland-based Clark Construction. While there is a high demand for construction projects, many contractors simply don't have the staff."*³⁸
--Construction Dive

In addition, a Global Data survey carried out in December 2021, covering all global regions, found that 34% of construction companies see a lack of sufficiently skilled labor as a barrier to investing in new technology.³⁹

LOW MARGINS, INFLATION & IT SPEND

Economic headwinds heavily impact low margins and Information Technology (IT) spending. It can be hard to justify numerous significant software investments producing low margins in the context of inflationary pressures while also creating the ongoing balance sheet and income statement effects. A Deloitte survey showed that many E&C companies are investing in digital but not making progress. *"Many allocate 39% of overall operational budgets to digital initiatives."*⁴⁰ Their report on insurance carriers shows the same dynamic. *"Carriers have frequently taken a piecemeal approach to technology modernization, transforming system by system, function by function, and app by app. Investment decisions have been mainly driven by shorter-term budget and feasibility considerations rather than achieving longer term competitiveness though improved customer experience."*⁴¹

³² From start-up to scale-up: Accelerating growth in construction technology. (2023, May 3). McKinsey & Company.

³³ Schäfer, A., & Zuberer, J. (2021). How to build (in) the future. [www.ey.com](https://www.ey.com/en_it/strategy/how-to-build-in-the-future). https://www.ey.com/en_it/strategy/how-to-build-in-the-future

³⁴ Connected Construction: A new technology mindset for a new era. (n.d.). <https://get.trimble.com/cons-global-data-report.html>

³⁵ From start-up to scale-up: Accelerating growth in construction technology. (2023, May 3). McKinsey & Company.

³⁶ Employed persons by detailed occupation and age : U.S. Bureau of Labor Statistics. (2023, January 25). <https://www.bls.gov/cps/cpsaat11b.htm>

³⁷ Ellis, G. (2023). 2023 Construction Trends: 23+ Experts Share Insight. Digital Builder.

³⁸ Phillips, Z. (2023, May 25). Construction's age problem: A foreboding exodus of experience. Construction Dive.

³⁹ Connected Construction: A new technology mindset for a new era. (n.d.). <https://get.trimble.com/cons-global-data-report.html>

⁴⁰ Engineering and construction industry playbook. (n.d.). Deloitte United States.

⁴¹ Agnew, D. (2022, November 15). What Awaits Commercial Insurance in 2023? This New Deloitte Report Looks Ahead. Risk & Insurance.

KPMG noted in their industry survey that there *"is a highly fragmented structure where many players have neither the size nor the incentive to invest in new technology or methodologies, especially when contractors take on paper-thin margins that leave little room for error. Between 1997 and 2021, construction productivity fell by 7 percent, whereas in the manufacturing sector it rose by 126 percent."*⁴² According to Trimble, *"Construction firms continue to use a perpetual license model for consuming construction technology solutions, which means they miss out on important benefits related to flexibility, scalability, ease of use, enhanced cost management, and improved return on investment (ROI)."*⁴³

ADOPTION & SCALING

The final barrier to transformation is adoption and scaling to challenges.⁴⁴ While companies have many software choices, customer retention is erratic and costly. Many customers or "users" switch products depending on preferences and staff changes.⁴⁵ McKinsey observed that purchase decisions are often made at the project level.

"As a result, companies need to resell the product again to the next project, which drives down net retention and raises acquisition costs. As one investor said, "The most successful companies have a plan to sell to the enterprise, not just the project." ⁴⁶ --McKinsey

Some experts have reported that labor has technology "fatigue," so much so that a percentage of labor move positions down or out of a project to avoid dealing with it.

Within the 120+ silos defined by Covenantz' AI/ML Engine, construction technology (Contech) leader, Trimble, offers a single project-centric platform with real-time business insights, collaboration, resource management, and cloud or subscription-based licensing. However, they focus solely on the construction industry. Trimble states their most significant barrier to expansion is *"change management...trying to change the mindset. If you're going to introduce a piece of software, it's about getting everyone on board, and the only way you're going to be able to do that is with a lot of interaction and training."*⁴⁷ Change management is not the only path to digital transformation; it may be part of the problem.

Oracle and SAP dominate the Enterprise Resource Planning (ERP) space, though no real innovation has impacted client bottom lines in years because neither Company has been able to integrate the divisions that transcend barriers and create customer value; instead, investment in Oracle and SAP solutions is not only significant from a cash perspective, but it also brings forth long-term balance sheet and income statement effects that serve as a drag on earnings and impedes further industry innovation.

Legacy systems, field equipment, segregated divisions, and entrenched business processes inhibit the collaborative network effect required to scale an integrated ecosystem. There are multiple communication methods, paper records and dumpsters of data, manual and outdated processes, and wide-ranging abilities to manage or adopt newer digital paper tigers. Like an old house, far too many systems need to be upgraded. There are hundreds of "silo" software applications but no true integrators to create the "one-stop shopping" interoperability the industry craves. Finding a cost-effective way to transform legacy systems is crucial.

⁴² Armstrong, G., Gilge, C., & Max, K. (2023, May 10). 2023 Global Construction Survey : Familiar challenges — new approaches. KPMG.

⁴³ Connected Construction: A new technology mindset for a new era. (n.d.). <https://get.trimble.com/cons-global-data-report.html>

⁴⁴ From start-up to scale-up: Accelerating growth in construction technology. (2023, May 3). McKinsey & Company.

⁴⁵ From start-up to scale-up: Accelerating growth in construction technology. (2023, May 3). McKinsey & Company.

⁴⁶ From start-up to scale-up: Accelerating growth in construction technology. (2023, May 3). McKinsey & Company.

⁴⁷ Connected Construction: A new technology mindset for a new era. (n.d.). <https://get.trimble.com/cons-global-data-report.html>

What are the top solutions?

*"Digital technologies enable many siloed networks to converge and form a large single network or Ecosystem. This converged Ecosystem is designed to be more secure and agile and can deliver value at a larger scale."*⁴⁸ --Deloitte

According to McKinsey, investors are looking for AEC technology companies pursuing a big total addressable market and bold vision to create a seamless user experience and unlock newfound value for a broad set of customers.⁴⁹ They look for platforms with expanded core offerings beyond architects and engineers, who connect to suppliers, project owners, banks, and insurance to improve project outcomes' predictability and net customer retention.

ECOSYSTEM CONVENERS

Industry advisors have identified the ecosystem approach as the most intuitive and likely to create progress.

*"Ecosystems can thrive when they foster the interconnections of people, processes, equipment, and virtual counterparts. The study shows that firms investing and participating in ecosystems will likely see higher strategic benefits."*⁵⁰ --Deloitte

Deloitte found that the *ecosystem approach* amplifies collective network strength and brings stakeholders to a common platform, resulting in higher collaboration, reduced project risks, more efficient portfolio management, and improved outcomes for all. It also improves response to disruptions (jobs site, supply chain, customers, talent).⁵¹ They further recommend that companies look for a *"Leveraging Convener"* to connect their clients' business objectives with a mature ecosystem platform. So, rather than invest time and money into creating an in-house ecosystem, find one ready to go and tap into those existing resources. The value drawn from this approach increases exponentially as connections grow.⁵²

EY further endorses joining established networks or ecosystems of related enterprises.⁵³ They say, *"True innovation is increasingly difficult to achieve alone. By joining established ecosystems or platforms or building new networks where groups of companies can collaborate, connect products, and go to market with a coordinated value proposition, faster and more powerful innovation and expansion become possible. Also, this can unlock previously unattainable technology and boost the quality of value propositions significantly."*⁵⁴

Mergers and convergence will drive much of the evolution needed to create value for the industry. Traditional businesses have the advantage of market dominance in their sector but will lose longer term to the much nimbler customer-focused digital ecosystem model. The technology to connect and integrate with intelligence and transparency has finally matured enough to present the goldilocks conditions for 4IR. Today, bringing together geographically and functionally distant stakeholders across time and space is possible in a secure web of sovereign networks, platforms, data centers, and more robust software tools. The biggest challenge is cutting through the jargon and hybrid solutions to determine the best prospects for an integrated ecosystem approach.

How the holy grail ecosystem is defined, developed, and supported remains the secret sauce of great anticipation. ***Covenantz has the recipe.***

⁴⁸ *Engineering and construction industry playbook. (n.d.). Deloitte United States.*

⁴⁹ *From start-up to scale-up: Accelerating growth in construction technology. (2023, May 3). McKinsey & Company.*

⁵⁰ *Engineering and construction industry playbook. (n.d.). Deloitte United States.*

⁵¹ *Engineering and construction industry playbook. (n.d.). Deloitte United States.*

⁵² *Engineering and construction industry playbook. (n.d.). Deloitte United States.*

⁵³ Schäfer, A., & Zuberer, J. (2021). *How to build (in) the future.* www.ey.com. https://www.ey.com/en_it/strategy/how-to-build-in-the-future

⁵⁴ Schäfer, A., & Zuberer, J. (2021). *How to build (in) the future.* www.ey.com. https://www.ey.com/en_it/strategy/how-to-build-in-the-future

How does Covenantz deliver?

THE KIREGISTRY ECOSYSTEM

Covenantz created KiRegistry, a *Built Environment Ecosystem* platform that delivers greater profits, less waste, and seamless integration for the AEC, finance, insurance, government, and manufacturing industries.

Covenantz offers the best solution to connect stakeholders across sectors and skill levels with a simple, easy-to-implement, secure interface that enables better KPIs with validated APIs. KiRegistry powered by Covenantz is a single platform integrating sensitive data in a mutually beneficial collaborative ecosystem that will reverse the decades-long decline in construction and the Built Environment.



THE COVENANTZ RECIPE

KiRegistry powered by Covenantz is the first global 4IR enterprise network streamlining entire processes, from initial concept to final occupancy and through lifecycle management. This ecosystem allows financiers, owners, and insurance entities to mitigate risks before the money flows; the platform informs and improves outcomes, exits, and expansions earlier in the build process. In addition, the platform enables stakeholders such as architects, engineers, and contractors to collaborate in real-time, eliminating the need for the typical litany of non-productive meetings and costly delays while providing a record of accountability. The ecosystem provides software developers, manufacturers, and suppliers a network to share and innovate like never before.

INTEROPERABILITY & INTEGRATION

- KiRegistry integrates 120+ silos to reduce fragmentation in the Built Environment.
- KiRegistry's network supports skilled labor and portability on a global basis.
- Membership in KiRegistry is free for every member of the Built Environment, significantly lowering barriers to entry and participation.
- KiRegistry is a global ecosystem for the Built Environment and is scalable across multiple industries, including automotive, aerospace, healthcare, and more.

IMPROVED MARGINS & ROI

- Covenantz's Intelligent Covenant Management (ICM) processes create project acceleration, time compression, cost reduction, and increased portfolio capacity.
- Covenantz processes have delivered complex construction projects in one-third of the time, significantly reducing financing and insurance costs and creating significant value for prime and subcontracted services providers and suppliers.
- Architects stated that Covenantz processes reduced 80% of their busy work while providing demonstrable project records.

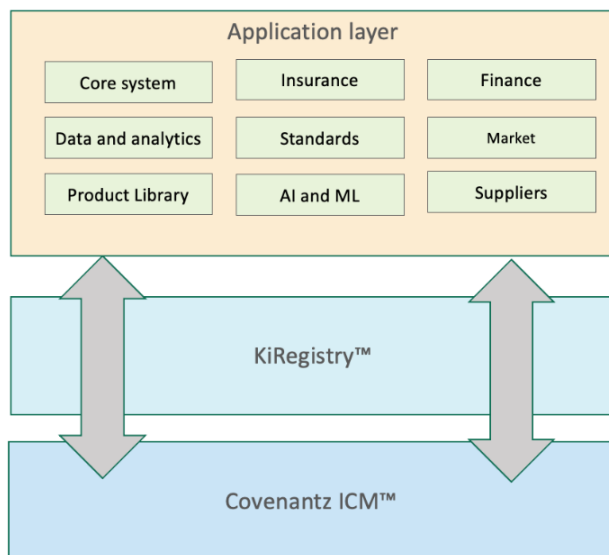
ESG REGULATION AND CARBON PROVENANCE

- Covenantz' Global Product Library helps deliver and foster sustainable products in the planning and building process, including:
 - Improved standards in manufacturing, and better investment, cost management, and policy decisions.
 - A Geolocating global resource tool for carbon provenance, tracking, and accountability.
- Covenantz processes have provided a 15-25% carbon reduction on projects.

DATA ASSET MANAGEMENT (DAM) & SOVEREIGNTY

- Covenantz enables asset owners *Data Asset Management Sovereignty* – a fundamental shift allowing members to own, intellectually harvest and monetize the value of their data.
- Covenantz tracks every touch point and all interactions and maintains version control throughout the entire lifecycle of a project, reducing legal and risk exposure.
- Data are owned by projects, members, and creators, enabling value creation across project and product lifespan through existing and prospective data exchanges.
- Member data are secure through geolocated *sovereign servers*.
- Covenantz's data analytic tools and features allow for improved data management, analytics, and monetization.
- All members have a right to privacy.

TECHNOLOGY



- Versatile, scalable, intuitive
 - Seamless plug and play
 - Integration of diverse APIs
 - Data from multiple sources (internal/external)
 - Streamed from field, origin point, or individual
 - Easy use with broad interoperability
 - Data shared across apps
-
- Secure KiRegistry User Interface (UI)
 - Global product library database
 - Data centers in geographically secure locations
-
- Secure Covenantz IP platform architecture
 - AI/ML Engine
 - ICBE, CLC, C-Cistern

At its core, Covenantz powers KiRegistry with AI/ML technology that is API-compatible. Kiregistry.org is constructed as a service-oriented architecture (SOA), an architectural style that focuses on discrete services instead of a monolithic design.⁵⁵ Consequently, it is also applied in software design, where services are provided to the other components by application components through a communication protocol over a network. All Covenantz and KiRegistry integration and API systems currently operate on AWS Cloud.

⁵⁵ Wikipedia contributors. (2023). Service-oriented architecture. Wikipedia. https://en.wikipedia.org/wiki/Service-oriented_architecture#cite_note-0-1

The Company's mission is to continue unlocking value for the entire Built Environment and every major industry platform, creating enterprise asset growth.

AND MUCH MORE

Below are samples of the many industry **problems** identified by Covenantz and the **solutions** and **member benefits** of the KiRegistry Ecosystem:

PROBLEMS

- Capital Risk
- Insurance Risk
- Portfolio Risk
- Supply Risk
- Legal Exposure
- Design Inefficiencies
- Covenant Breach
- Liquidity Impediments
- Completion Risk
- Fraud
- Complex Siloed Industry
- Extended Carrying Costs
- Non-compliance
- Finance Risk
- Failed Project Exits
- Cost Overruns
- Green Washing
- Document Chaos
- Slow AR
- Creditor Management
- Time Delays

OUR SOLUTIONS

- Global Product Library
- Carbon Provenance
- Materials Verification
- Green Validation Services
- Covenant Management
- Digital Asset Management
- Geolocation
- KiRegistry Ecosystem
- Completion Strategies
- Covenantz ICM Platform
- Proprietary Algorithms
- Generative AI/ML
- Inspection Services
- Bid Qualifiers
- SOV Management
- Advisory/ERM/ERP+
- Enable Finance Analysis
- Lifecycle Management
- Aid & Recovery Contracts
- Social Network for Industry
- OKRs - APIs - ICBEs

MEMBER BENEFITS

- Financial Controls & Exits
- Digital Contracts
- Data Sovereignty
- Digital Monetization
- Risk Mitigation
- Compliance
- Time Compression
- Project Acceleration
- Increased Profitability
- Carbon Management
- Community & Collaboration
- Transparency
- Members Join Free
- Reduced Costs
- Increased Portfolio Capacity
- Maximize Labor output
- Deliver Projects Faster
- Liquidated Damage Mgmt
- Trade Damage Mitigation
- Secure Transactions
- Inspection

COVENANTZ VALUE PROPOSITION

KiRegistry.org creates opportunities for members to expand value within financial capacities for compression, acceleration, or capital redeployment with the utmost transparency and risk management for project owners, insurers, financiers, and contracted delivery companies – while delivering significant cost savings.

For more information, contact Covenantz at feedback@covenantz.com.