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BUILD USA

PRESENTS

WHITE PAPER FOUR

THE LAST OF THE WHITEPAPER SERIES

THE NEAR FUTURE OF THE BUILDING INDUSTRY

SYNTECGROUP

Contents

Introduction

The near future of the building industry will be defined by the dominance of digital technology, the rise of optimized building, and the emergence of new paradigms of corporate organization.

The Fourth Industrial Revolution

Over the past decade, the evolution of digital technology has radically transformed almost every sector of the global economy, inaugurating a new era known as the **Fourth Industrial Revolution** (also known as Industry 4.0 or 4IR). Industry 4.0 centers around total connectivity. It features technologies that blur the boundaries between the physical, digital, and biological realms: Artificial intelligence (AI), the Internet of Things (IoT), robotics, virtual reality, biotechnology, nanotechnology, autonomous vehicles, 3-D printing, etc. While Industry 4.0 builds upon the historical legacy of the **first three industrial revolutions**—the steam engine and water power (First); electricity and the assembly line (Second); the computer and information technology (Third)—it is evolving at an exponential rather than a linear pace. For example, today there are 60-70 billion connected devices. By 2035, there will be 1 trillion connected devices.

In the building industry, the technologies driving Industry 4.0 are changing how infrastructure, real estate and other built assets are designed, constructed, operated, and maintained. These technologies—AI, big data analytics, collaborative digital environments, digital twins, drones, wearables, wireless sensors, augmented and virtual reality, automated and robotic equipment, and more—have the potential to make buildings smart, energy efficient, sustainable, and of enduring aesthetic and functional value. The considerable amount of data generated across the supply chain during the entire building life cycle, if properly organized and integrated, can be harnessed to drive profitability, cut costs, enhance safety, and reduce waste.

In addition, full-scale digitization could help the building industry generate an estimated **12-20% in annual cost savings, equal to between $1 trillion and $1.7 trillion.** Given that the industry makes up 6% of global GDP, the economic and social upside

is significant. Companies that invest now in digital infrastructure and data analyzing capabilities will be poised for success in the new era.

Building Orders

In the near future, four building delivery processes will emerge:

1. Boutique projects that offer high-end custom-building solutions based on the unique preferences of an owner or client.
2. Iconic projects that develop large-scale structures that push the boundaries of current building technologies and techniques.
3. Optimized, or "modular," projects that focus on buildings used throughout the built environment and do not require one-off customization for optimal performance.
4. Hybrid projects that combine features of #1, #2, and #3.

A greater number of builders and clients will choose optimized because of its ability to consistently deliver high quality buildings in shorter time and at lower cost. Modular production occurs in a controlled environment with consistent standards and workflows and can leverage the economic benefits of producing at scale. Further, the optimized process will offer clients a superior customer service experience.

Today, building projects are typically custom, one-off endeavors. A client has to deal with a variety of personnel (architects, consultants, contractors, builders, etc.) who are not always aligned with each other, and often operate in their own silos. It's difficult for the client to determine who to trust. Further, projects are often beset by delays, errors, and budget overruns. The final result is uncertain. The experience for the client can be frustrating and disappointing.

In contrast, the optimized process can eliminate many of these issues and dramatically reduce the uncontrolled variables in a building project. Like cars, modular buildings will be developed on standardized chassis, with a sufficient variety of custom options to satisfy the client's personal preferences. In addition to aesthetic and functional features for each building, this menu of custom options will include a predetermined project schedule with definitive deadlines. The AECM can walk the client through these options, and flexibly adjust to the specific conditions of the building site and the demands of the local community. The customer experience will be interesting and rewarding, rather than the opposite. The optimized process

promises to revise the relationship between the user and the building industry—and for the better.

Building Organizations

Teams with substantial reach, resources, diversity of skill sets, and digital competence will be better positioned to capitalize on the building projects, consulting engagements, and investment opportunities of the coming decade. Forward-thinking industry players are developing new collaborative paradigms for the digital age. These new paradigms contrast with the traditional grouping of architect, engineer, general contractor, and design-and-build contractor. Two emergent organizational models will differentiate themselves in the near future:

- **Internally Integrated Business Conglomerates (IIBC).** Organizations of the IIBC model are represented today by large-scale companies like Bechtel and AECOM that have complete verticals in almost all market sectors and services.

- **Collaboratively Integrated Partner Organizations (CIPO).** The CIPO model refers to small and mid-size firms who have developed strong individual brands and cultures, yet choose to join collaborative organizations that can pool the required skills, processes, and resources to compete on projects of all scales and remain nimble enough to quickly adjust to market shifts. The companies in CIPOs can maximize efficiency by working together on collaborative digital platforms that allow seamless data integration and information sharing within and between businesses.

BuildUSA

BuildUSA was developed to help industry stakeholders meet the demands of the future. The goal of BuildUSA is to position itself as a leading solution provider to the building industry, focused on integrated product development, project collaboration, and branded high-performance optimized buildings.

Prototype Initiative

The “Prototype Initiative (PI)” is a business strategy focused on developing a set of inter-disciplinary solutions for the building industry. It aims to create a branded process that provides “High Quality,” “High Performing” buildings in a “Shorter Period of Time” and at a “Lower Cost.”

The three core aspects of the PI are Research, Process, and Execution.

Research

BUSA supports applied research into building products and systems that promote sustainability, enhance occupant comfort, support wellness goals, and improve building performance.

BUSA’s module products integrate the individual elements of building into prefabricated modules such as panels or rooms that can be assembled on site. The custom, one-off nature of building projects means that people build the same things slightly differently every single time. This lack of standardization often leads to inconsistency, disagreement, lost time, and lost money. BUSA’s Construction Assembly Modules (CAMs) standardize the design and installation of complex units such as rooms, panels, and racks. CAMs, also apply to integrated sensor and lighting products.

In the near future, BUSA will be exploring product offerings in three developing fields: 1) new building materials evolving out of nanotechnology and accelerated building science research; 2) energy distribution systems such as smart grids and shared dc/ac power distribution; 3) integrated building automation systems that synthesize on-site sensor data and optimize ongoing maintenance.

Process

The Process category centers around the development of a cloud-based collaborative data environment called the BCE. The BCE allows all project participants to access, share, and add data within a collaborative environment organized around consistent standards, templates, and workflows. The BCE integrates multiple software applications into a central digital platform, including BIM, digital twin, data analytics, third party apps, and more. , The construction documentation typically developed by the A/E team will be expanded to include

the material procurement chain, sub-contractor marketplace, construction management, asset management, operations, and maintenance. The BCE functions as the single source of truth for a project, and significantly enhances project efficiency, security, quality, and performance.

Execution

The Execution category focuses on BuildUSA's efforts to develop a series of modular building types for the healthcare industry. As time goes on, more and more healthcare will be moved out of the critical care hospital box and into the ambulatory setting. Modular solutions provide adaptable, high-performing healthcare workspaces that can be put into operation in much shorter timeframes and at much lower cost than traditional buildings.

Three building types are currently in development:

- The first building set for market delivery is the Optimized Ambulatory Building. The OAB provides same day health delivery services and offers optimized service suites that allow for standardized horizontal and vertical expansion to adjust to ongoing needs.
- The Spine Building is a "plug and play" structure designed to offer Flexible Service Delivery, with the ability to adjust to community needs. Additionally, it offers on demand disaster response and surge capacity. Within hours, the building can provide services for an impacted community by quickly adapting to changing seasonal, special event, or disaster needs.
- The Health and Wellness Home provides a home infection control zone with negative pressure containment and Telemetry Healthcare Delivery. Its functional design will dramatically reduce unnecessary healthcare visits, cut costs, and decrease cross contamination.

There are a variety of consulting services that BuildUSA will offer to support the implementation of these services and products. Additionally, as the BCE accumulates more and more data, powerful Reporting and Predictive Analytics tools will provide important insights to users.

Conclusion

Today, the majority of companies in the building industry still cling to traditional methods of operation and ways of thinking. Many still rely on two-dimensional, non-digital processes to

manage their activities. In order to flourish in the 21st century, the industry needs to overcome its resistance to change and embrace the digital age.

Economist Klaus Schwab, who first introduced the concept of the **"Fourth Industrial Revolution,"** writes the following about the opportunities and challenges of the new era: "The changes are so profound that, from the perspective of human history, there has never been a time of greater promise or potential peril. My concern, however, is that decision-makers are too often caught in traditional, linear (and non-disruptive) thinking or too absorbed by immediate concerns to think strategically about the forces of disruption and innovation shaping our future."

His words apply to every contemporary business leader, and especially to key stakeholders in the building industry. In our current context of accelerating disruption, informed strategic thinking about the future is a prerequisite for success. Unless the wider industry seizes the opportunities--and the opportunities, like the challenges, are unprecedented—it will become a mere follower, rather than an imaginative, dynamic leader. All businesses must transform into smart, connected, digitally integrated organizations, or risk falling behind the competition.

Building is changing. Change with it or go out of business. Ultimately, it's that simple.

However, knowing how to effectively introduce and manage change within your organization is not so simple. While digital tools offer tremendous upside, they require proper implementation to maximize their potential benefits. If data is unstructured, inaccessible or un-shareable, digital technology capable of harnessing the power of data will be ineffective. Currently, industry players are working in their own silos—with their own templates, standards, and workflows—and few understand how to leverage the power of data. To harness the power of data analytics, AI, automation, and other Industry 4.0 technologies, it is necessary to optimize how data is structured and shared across the lifecycle of a building project. This means developing consistent and agreed upon standards, templates, and workflows in a collaborative environment.

In other words, you have to change smart and make a strategic investment in the future, with the right partners and the right products.

BuildUSA is a strategic vision of the future of building that also offers specific tools, processes, and support to help make that vision a reality. We are here to help you make the best investment possible.

Meet the Author

CEO / Founder – Steve Salzman. Steve holds a Bachelor of Architectural Science from the University of Illinois. His career has encompassed the areas of architecture, design, construction management, and real estate development. Building and running multiple companies has afforded him the opportunity to develop an intimate understanding of all phases of the building process. These professional activities coupled with a personal interest has led to extensive research on how to develop and deploy new technology, new building materials and new building prototypes. As a recognized in leader in the rapidly changing building industry, Steve applies his industry-specific experience to provide executive leadership to The Syntec Group in the areas of client and project development and collaboration, market penetration, technology and strategic planning.

About BuildUSA

Evolving market realities have begun to significantly impact the historical cottage industry nature of Building. Firms of all sizes will increasingly develop collaborative organizations that pool the required shared digital workflows, standards, and resources. Collaboratively Integrated Partner Organizations (CIPO's) will strive to maintain their unique identity/culture while remaining agile and strong enough to both accommodate and drive market shifts. BuildUSA-Chicago (BUSA-C), will be the first CIPO group and will focus on the Midwest region, providing a branded building process that will offer:

"High Quality", "High Performing" buildings to the market in "Shorter Periods of Time" and at "Lower Costs".

About The Syntec Group

Syntec Group is comprised of leading building industry solution providers expert in each specialty required to address all your building and facility needs. The Syntec Group's business protocols and management tools result in seamless projects, well informed owner's and positive outcomes.

We strive to provide our clients:
Real world experience, creatively applied, using cutting edge business & technology solutions.

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