SIEMENS' BUILDING X OPEN PLATFORM AND DEVELOPER ECOSYSTEM

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INTRODUCTION AND EXECUTIVE SUMMARY

SIEMENS BUILDING X BRINGS OPENNESS TO THE SMART BUILDINGS MARKET

With less than 5% of buildings currently being smart, Siemens is embarking on more open technology solutions to accelerate the growth of this promising and largely untapped market. Building X is designed and positioned to unlock the wider smart buildings ecosystem through approaches favoring hardware-agnostic interoperability and seamless integration with legacy hardware and software solutions.

While Building X is a great platform for managing large numbers of buildings in a more automated and profitable way (thereby also addressing an increasing lack of technicians), its greatest appeal is in addressing looming sustainability and net-zero targets—the elephant in the room, with buildings generating more than a third of all emissions.

In this context, Artificial Intelligence (AI)-enabled Energy and Sustainability Manager applications are key components of Building X. Siemens claims its technology has already enabled US$4 billion worth of energy savings for its customers.

Going forward, Siemens will systematically bring all existing and new client installations under the Building X umbrella. This includes more than 51,000 "Building X components" already deployed today. Key clients that have already adopted Building X include SYK (university facilities), Cloudline Solutions (System Integrator (SI)), PRODEA Investments (real estate investment company), and Mobile Energietechnik (service providers).

BUILDING X OPEN PLATFORM LEVERAGES DEVELOPER ECOSYSTEM TO BRING SOLUTIONS TO THE MARKET

The Building X platform allows third-party developers, SIs, and building managers alike to develop their own applications addressing specific requirements for specific verticals and regions. In this respect, the Building X approach can be compared with a smartphone Operating System (OS) on top of which third-party software developers are designing a wide range of additional functionalities.

Siemens has made available a suite of developer support tools, including Software Development Kits (SDKs) and low-code software development. Growing the Building X third-party developer ecosystem will be a very challenging, but a critical success factor for the future growth of Building X in terms of available applications, richness of feature sets, vertical market requirements addressed, and, ultimately, the number of clients and overall business value generated, especially as competitors are adopting similar approaches. The Siemens Xcelerator marketplace facilitates application discovery, and seamless Business-to-Business (B2B) commerce is an equally critical part of Siemens' strategy of openness going forward.

Siemens' Building X featured in these recent ABI Research competitive ranking reports: Commercial and Industrial Energy Management Systems (in which Building X ranked first) and Smart Building Management Platforms.

THE ROLE OF BUILDING X IN A FAST-EVOLVING SMART BUILDINGS MARKET

SMART BUILDINGS—NEW CHALLENGES AND REQUIREMENTS IMPOSING MORE FLEXIBILITY

Building managers globally are facing a growing number of new challenges related to changing circumstances, regulations, and requirements, transforming the very nature of building management:

- **Energy Efficiency:** Wide-ranging energy management efforts to reduce energy consumption and reduce costs due to rising energy prices. Examples include occupancy-based lighting and heating.

- **Sustainability and Net-Zero Buildings Regulations:** Regulatory pressures to reduce carbon emissions to reach net-zero operations by generating renewables on-site and/or purchasing green energy through Power Purchase Agreements (PPAs), as well as the integration of heat pumps. According to commercial real estate services company JLL, the percentage of existing buildings retrofitted yearly will need to triple to meet global net-zero targets. Focusing only on new buildings will be insufficient.

- **Circularity Regulations:** The use of recycled construction materials for both new buildings and upgrading existing buildings.

- **Increased Security Risks:** Increasing efforts to protect facilities from both physical access and cybersecurity threats are needed urgently. This also includes protection against fire and the impact of natural disasters, many of which are caused by climate change.

- **New Building Usage Modes:** In the wake of COVID-19, buildings have been repurposed for new types of tenants; for example, turning office buildings into residential housing and retail spaces. At the same time, hybrid remote and on-site working habits are redefining the very concept of space occupancy management.

- **Increasing Expectations around Convenience and Comfort:** Ranging from sophisticated and automated Heating, Ventilation, and Air Conditioning (HVAC) systems for optimized environmental conditions to app-based remote-control capabilities.

Additionally, the above trends vary largely across the various building types and categories ranging from office buildings and venues to multi-tenant apartment blocks, industrial facilities such as warehouses, data centers, and critical infrastructure. Building managers need to have access to very granular information via easy to use dashboards to be able to manage and optimize all building operational parameters.

SIEMENS' ANSWER: BUILDING X

For ecosystem players like Siemens, the need to develop flexible solutions to address the challenges outlined above are critical to future-proof the very concept of building management. This is where Building X comes in. Siemens defines Building X as a "digital building platform that supports customers to digitalize, manage, and optimize their building operations. This leads to improved sustainability, increased operational performance, and higher building value." It helps create sustainable, autonomous, and profitable buildings:

Building X enables:

- Enhanced user experiences for occupants
- Real-time data derived from sensors, cameras, smart equipment, field devices, edge applications, cloud-to-cloud connectivity, and integration with third-party automation software
- Expanded commercialization through Siemens Xcelerator Marketplace
- Energy savings of up to 30%

Building X offers an open and agile platform allowing third party software developers to design solutions for a wide range of use cases and verticals, made available on easily accessible marketplaces. This approach puts Siemens at the heart of a growing smart buildings ecosystem of technology vendors, installers, and building managers, which collectively will be able to address the building challenges of the future. This is illustrated in the diagram below highlighting the technology components, applications, use cases, Application Programming Interfaces (APIs), and ecosystem openness offered by the Building X platform.

Building X
A digital platform that digitalizes, manages, and optimizes building operations.
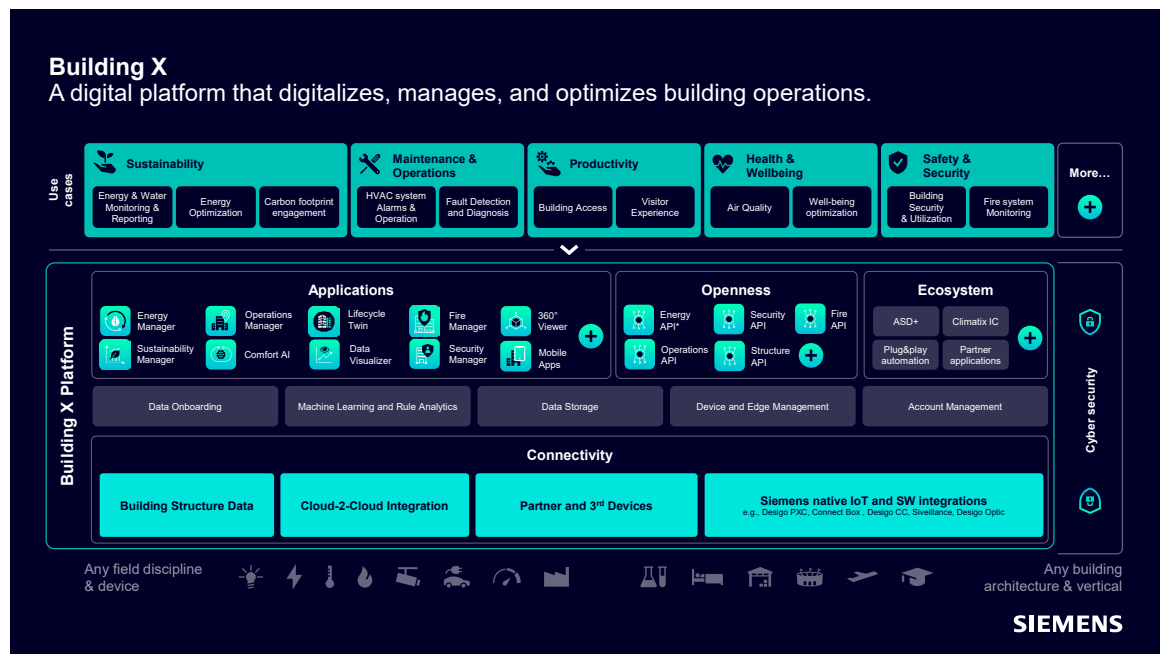
SIEMENS

Siemens' approach is squarely aimed at modularity and seamless integration, more than at cumbersome and tedious customization, enabling faster deployments.

BUILDING X DASHBOARDS

Building X offers a wide range of flexible dashboards enabling monitoring and managing all aspects of smart buildings. The example below shows a Comfort AI dashboard for monitoring indoor temperatures and keeping them within preset comfort bounds.
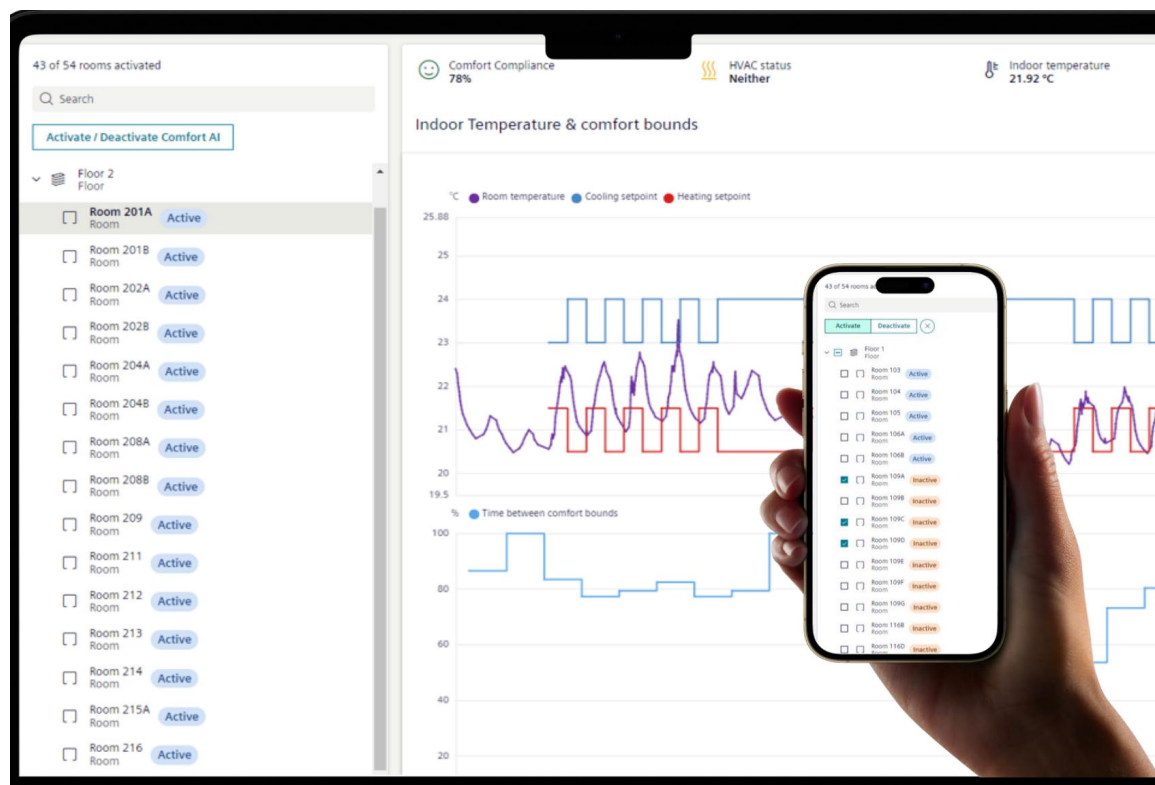
BUILDING X AND CYBERSECURITY

Open systems are more vulnerable and hence more susceptible to cyberattacks. Cybersecurity has been a top priority for Siemens while designing Building X, which features built-in cybersecurity technologies compliant with all major standards. Cloud security is based on Amazon Web Services (AWS) security services, including AWS Key Management Service, AWS Secrets Manager, AWS Security Hub, and AWS Config. Siemens' Security Emergency Management includes incident & vulnerability handling and continuous threat monitoring. This future-proof cybersecurity approach will be key to allaying security fears of potential customers considering adopting Building X.
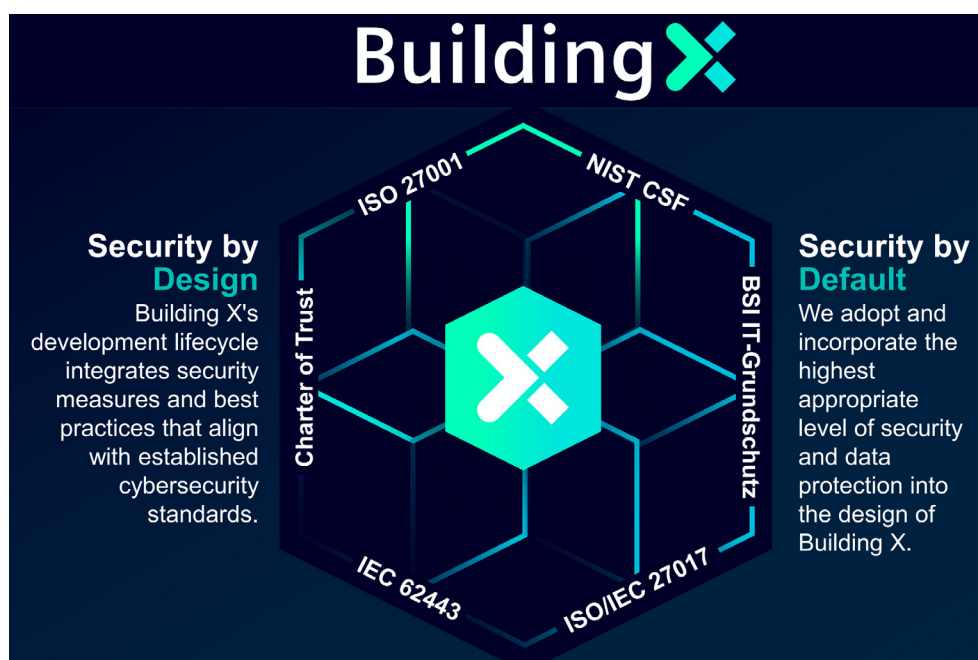
BUILDING X AND SIEMENS XCELERATOR

Building X is part of Siemens Xcelerator, described by Siemens as "an open digital business platform that enables customers to accelerate their digital transformation easier, faster, and at scale." Other smart Infrastructure Siemens Xcelerator umbrella brands include Gridscale X (grid management for utilities) and Electrification X (low/medium voltage systems for commercial and industrial clients).

Siemens Xcelerator @ Smart Infrastructure technology solutions include connected and standardized hardware, software, and digital services. Key design principles include "as-a-Service," interoperability, flexibility, openness, and cybersecurity.

The Siemens Xcelerator Marketplace provides a seamless channel to provide solutions to customers in a frictionless way. The marketplace enables a partner ecosystem, adding value to Siemens' products and services to serve a wide range of customer requirements.

BUILDING X CASE STUDY: PRODEA Investments

PRODEA Investments manages a portfolio of more than 380 buildings in Greece, Cyprus, and Italy, including hotels, retail spaces, logistics facilities, and residential units. Its strategy focuses on technological innovation to increase tenant retention and improve operational

efficiency across its fleet of buildings, while transitioning toward more sustainable and user-centered buildings. It has chosen Siemens' Building X platform to enable this digital transformation focused on monitoring and optimizing energy consumption, costs, and emissions to comply with European Union (EU) environmental legislation. The Building X Energy Manager application and Siemens' Connect X300 gateway enables PRODEA Investments to effectively manage energy efficiency and carbon emissions in a forward-looking and proactive way toward achieving net-zero emissions targets.

BUILDING X OPEN SOFTWARE DEVELOPER PLATFORM AND ECOSYSTEM

The launch of Building X very much signals the start of a transformative journey for Siemens, deemphasizing its own legacy hardware smart buildings business in favor of a more open software-centric approach. This requires adopting a wide range of software skills and tools, not just internally, but also for the wider smart building developer ecosystem.

DEVELOPER PLATFORM FEATURES AND APIS

Building X has been designed as an open developer platform exposing a rich set of APIs, analytics, and dashboard features.

- **API Categories:** Accounts API, Building Structure API, Building Geometry API, Building Operations API, Point Value Ingest API, Energy API, Security Identities and Privileges API, Security Activities API, Fire API, Lifecycle Twin API

- **Building X Rules:** Implementation of business logic via low-code programming to create rules that express the analytics rationale and extract the business value (out-of-the-box analytics).
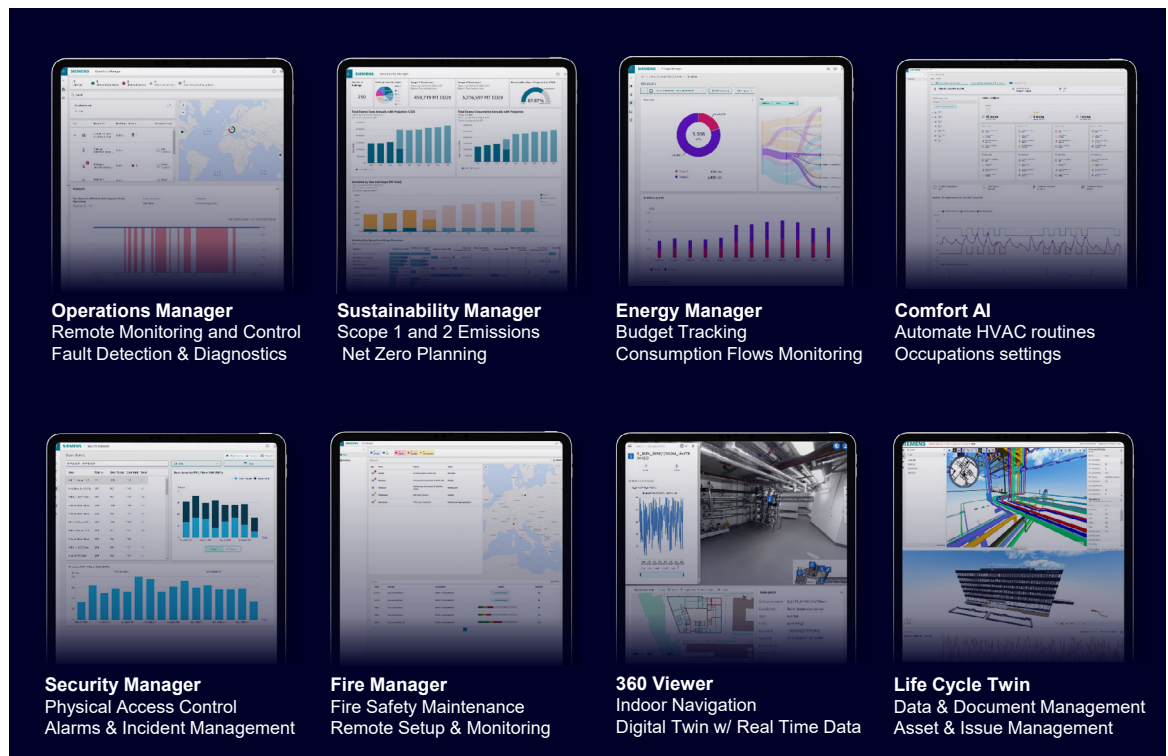
DEVELOPER SUPPORT TOOLS

Building X offers the entire range of developer tools, including a dedicated developer portal with centralized access to SDKs, APIs (API manager), and other resources to support developers with OpenAPI Specification (OAS) documentation, code snippets, and interactive examples. API products for commercial buildings are available on the Xcelerator marketplace.
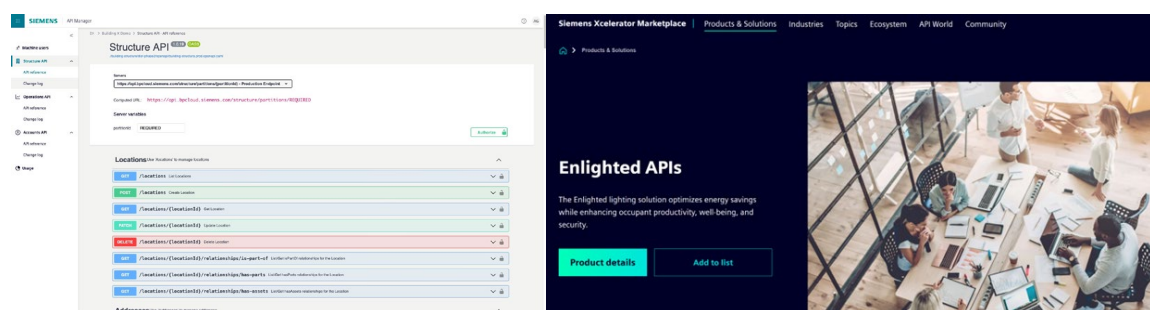
BUILDING X APPLICATIONS AND DEVELOPER ECOSYSTEM

Currently, there are 12 applications available on the Building X platform, with many more in development. The number, diversity, and quality of Building X applications will define the strength and attractiveness of the platform.

Operations Manager
Remote Monitoring and Control
Fault Detection & Diagnostics

Sustainability Manager
Scope 1 and 2 Emissions
Net Zero Planning

Energy Manager
Budget Tracking
Consumption Flows Monitoring

Comfort AI
Automate HVAC routines
Occupations settings

Security Manager
Physical Access Control
Alarms & Incident Management

Fire Manager
Fire Safety Maintenance
Remote Setup & Monitoring

360 Viewer
Indoor Navigation
Digital Twin w/ Real Time Data

Life Cycle Twin
Data & Document Management
Asset & Issue Management

BUILDING X DEVELOPER CASE STUDY: BEMBER SMART PARKING-AS-A-SERVICE

Bember is a Building X Ecosystem Partner that has developed a smart parking solution based on Building X edge technology and the X300 IoT Gateway, including a smart parking access app, automated billing system, license plate recognition, Electric Vehicle (EV) charging, and access control integration to Building X.
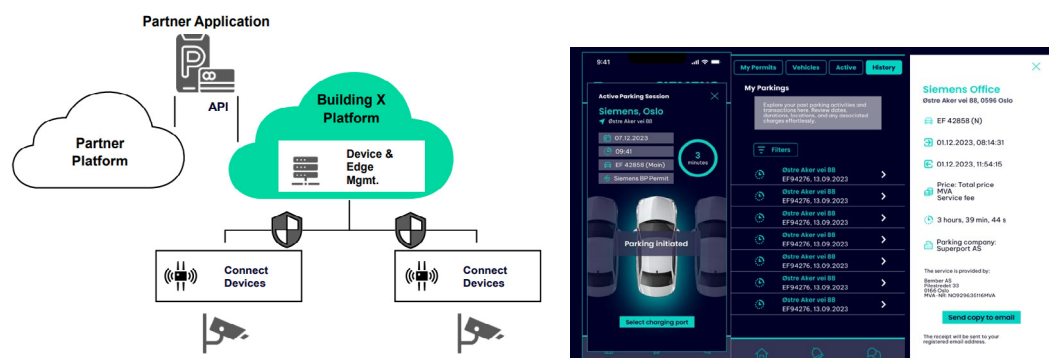
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