GS1 Australia

The Global Language of Business

Building and construction

Digital transformation in construction

Building the digital foundation for greater efficiency, transparency and sustainability

Today's construction industry is large, growing and significantly impacts the world's natural resources. Construction-related spending accounts for 13 percent of the world's Gross Domestic Product (GDP).[1] In Australia, the industry contributes over $200 Billion to the national economy. The industry emits over one-third of greenhouse gasses and consumes 25 percent of the world's water.[2]

Consider that in the past 20 years, the global average for construction's value-add per hour has increased by only 1 percent a year, compared to 4 percent growth in manufacturing.[3] It is also estimated that 90 percent of the world's infrastructure projects are either late or over-budget.[4]

Recent studies in the U.S., Scandinavia and UK suggest that up to 30 percent of construction is rework, labour is used at only 40 to 60 percent of potential efficiency and at least 10 percent of materials are wasted.[5]

Construction is also faced with significant demands to become much more efficient, improve productivity and lower costs throughout its global supply chain.

According to McKinsey, action in specified areas can boost the construction industry's productivity by 50 to 60 percent. Three of these areas involve increasing transparency, improving procurement and supply chain management, and infusing digital technology and advanced automation.

Manual, paper-based processes are predominately used with data about construction materials scattered throughout different databases. Documentation of construction products actually used in projects is not easily accessible, even less in digital form—if available at all.

Clearly, there is sizable opportunity to take the waste out of construction processes, making them highly efficient and sustainable.

GS1 global data standards support:

- Accountability in the supply chain
- Product traceability
- Building material and product compliance
- Sustainability
- BIM operational processes

"The Global Trade Item Number (GTIN) is an essential key for meeting the future demands in terms of digitalisation, traceability and the entire life cycle process within the construction industry."

Harri Savolainen
CPO, NCC

Digitalisation and BIM

Underpinning the use of Building Information Modeling (BIM), construction stakeholders are starting to invest in the digitalisation of their supply chain and circular economy processes. BIM is emerging as a "common template" from which all stakeholders can work, partly incentivised by regulatory demands for public building projects in some jurisdictions..

Yet, to effectively access and share information amongst stakeholders—both domestically and globally—GS1 global data standards are required as an essential element of the BIM framework.

One such critical GS1 standard—the Global Trade Item Number® (GTIN®)—uniquely identifies a physical product, acting as the unique reference to its "digital twin" and linking all the necessary data about the products/materials to facilitate automating processes. The serialised GTIN or SGTIN provides increased granularity to identify an individual instance of a particular product.

Both identifiers are critical as digital building blocks for driving increased efficiencies in supply chain management and traceability processes during the building phase, as well as maintenance and repair processes post-handover.

The GTIN or SGTIN information can be encoded in a range of data carriers including two-dimensional barcodes (e.g., GS1 DataMatrix barcode), applied to or engraved on the building product, or in an RFID (radio frequency identification) tag that can be embedded in the product. As technologies continue to evolve, data capture tools such as sensors or IoT devices will also require unique identification embedded to support interoperability between devices.

Information carried by the GTIN and SGTIN about building materials and products—their identity, batch/lot number, serial number and expiry date—can all be stored in different master data management systems and then, using openBIM standards, can be accessed and shared between national and cross-border trading partners.

Additionally, to ensure that building materials get to the right place, construction locations can be uniquely identified by a GS1 Global Location Number (GLN) which can be used to reference a range of attributable master data about a specific location, eg. truck entry points to a site or safety constraint information for drivers, etc.

Endnotes

1. McKinsey. (2017 February). Reinventing Construction: A Route to Higher Productivity.
2. Source: Cobuilder
3. McKinsey. (2017 February). Reinventing Construction: A Route to Higher Productivity.
4. The Economist. (17 August 2017). Efficiency eludes the construction industry.
5. Lean Construction Blog, London: HMSO. (2015 January 20). Rethinking Construction: Report of the Construction Task Force.
6. Source: Cobuilder

Transforming processes

Most construction projects are very complex—involving a myriad of contractors and sub-contractors, many suppliers from different countries, and an incredible number of building materials, products and components.

Products are typically ordered based on a required set of attributes, but not necessarily from specific manufacturers.

By identifying each building product with a GTIN and capturing the product's master data in a consistent way, suppliers can expand their brands' visibility to include new construction partners and building projects.

And construction sites can greatly expand their choice of products, extending their reach to new suppliers.

They can precisely order what's needed for building projects to avoid material waste and schedule delays. The increased use of global business-to-business e-platforms in construction will certainly accelerate this trend.

By using GS1 global data standards, onsite logistics can be substantially enhanced by getting the right product to the right site, at the right time and in the right sequence. Ensuring efficient transport processes are especially important since many large construction sites do not yet have specific postal addresses yet rely heavily on adhering to a building schedule.

GS1's track and trace standard (EPCIS), can provide all stakeholders with the needed visibility of building materials (and information about these materials) as they travel from manufacturers' warehouses to construction sites. It is also the foundation standard for achieving full product traceability to ensure that the products delivered and installed are indeed the products that were specified and procured, ensuring product compliance and meeting regulatory requirements.

"For over 15 years, GS1 standards, especially the GTIN, have been critical in InfraBuild's efforts to facilitate electronic trading and product traceability. Now, as the construction market increasingly demands full traceability of products throughout the supply chain, for both compliance and sustainability, the serialised GTIN and its integration into BIM is a logical and essential part of that journey."

David McNeil
Customer Experience Manager, InfraBuild

"The leadership role played by GS1 in the construction industry is proving to be a significant catalyst in the drive for achieving better quality assurance in the product and materials supply chain of the building industry."

Bruce Kohn
CEO, New Zealand Building Industry Federation

Driving sustainability

Globally, the construction industry uses 40 percent of resources, it produces 40 percent of waste and it consumes 40 percent of energy production.[6] Gaining efficiencies in construction can clearly have a significant impact on the health of the planet. Yet, in order to reuse, refurbish and recycle products and buildings, builders need to know which products were used in the construction of these buildings.

As a globally unique identifier, the GTIN enables the needed visibility of all products, parts and components used in building projects, making it a critical piece of any sustainability strategy. As efficiencies grow in construction processes, waste can be minimised and a more sustainable supply chain—down to the construction site—can be realised.

Construction, like many industries today, must guard against counterfeit building materials that can infiltrate their supply chains causing performance problems down the track.

By leveraging an SGTIN to uniquely identify an individual instance of a building product, all construction partners can verify the authenticity of the product and exchange data on its attributes, performance and MRO activities. Throughout the building product's life cycle, construction stakeholders can trace the product's raw materials back to their origins as well as track the product to its final building destination.

Building a better future today

The use of GS1 global data standards in construction is gaining momentum. Projects in Australia, France, New Zealand, Norway and Sweden are underway that are using GS1 standards, as well as in logistics processes to streamline operations, increase sustainability and lower costs.

Like other industries, many of this industry's challenges can be solved with support from GS1 standards that identify building products and help stakeholders share valuable information about them. By enriching the BIM model, GS1 standards can build the needed foundation for the industry's successful digital transformation.

About GS1 Australia

GS1 is a neutral, not-for-profit organisation that develops and maintains the most widely used global standards for efficient business communication. We are best known for the barcode, named by the BBC as one of "the 50 things that made the world economy". GS1 standards and services improve the efficiency, safety and visibility of supply chains across physical and digital channels in 25 sectors. With local Member Organisations in 114 countries, 2 million user companies and 6 billion transactions every day, GS1 standards create a common language that supports systems and processes across the globe.

For more information visit the GS1 Australia website **www.gs1au.org**

"GS1 standards for the identification of building products (GTIN and SGTIN) are well suited to provide full traceability, from design to disposal—today, for the physical and digital flow of goods and tomorrow, for smart products using RFID and sensors. Combined with GS1 standards for identification of locations (GLN and SGLN), this will enable better logistic flows throughout the lifespan of the building."

Inge Aarseth
Project Manager, Construction Department, Vestfold Hospital Trust

Contact us

For more information about GS1 standards in construction, contact us at construction@gs1au.org

GS1 Australia
Head Office, 8 Nexus Court, Mulgrave VIC 3170
Locked Bag 2, Mt Waverley VIC 3149
T 1300 227 263 | **F** +61 3 9558 9551 | **ABN** 67 005 529 920
www.gs1au.org

CONNECT WITH US

9 312345 021338