The road to standardising digital building product data in New Zealand

Having a library of digital building product data in an agreed, standardised format - and the means to share it easily across different organisations - would benefit the building sector. At present, product information exists, but it is held separately by different organisations in various formats. It is not easily searchable, accessed, combined, compared or analysed. A central resource of standardised product data could support supply chain processes and consent approvals, provide deeper insights into the sector and would lift construction sector performance and productivity.

Recent research shows that the New Zealand construction industry is data-rich but is also information poor, meaning the sector has plenty of data about building products but lacks the facility to easily share and transform the data into meaningful information.

The BRANZ-commissioned research by GS1 New Zealand shows that many organisations hold digital data about building products, but the data can be difficult to find and access. Because there is no agreed standard format for data on New Zealand building products, it can be difficult to compare datasets and there may be gaps.

There are costs for suppliers and building consent authorities needing detailed, comprehensive information about the building products approved and in use across New Zealand because compiling the necessary data involves significant and time-consuming search and rework. This also makes automating data services difficult.

The research found that there is a growing consensus from industry and government about the importance and benefits of having a freely available central library of master digital data about building products. This was identified in recent government research and industry consultation about related reforms to the regulations. There is also evidence for the benefits of this approach from other sectors, which has been observed when agreements and systems to supply standardised building product data were adopted in other countries.

The benefits of digital building product information

Having building product data available reduces information search, data entry, rework and compilation costs for all organisations. Data can be exchanged easily between multiple parties.

During a recent government consultation, some councils said that this kind of resource would reduce the work needed to assess the quality of building products and support the building consent process.

Major benefits of using digital tools and

systems also recognised in the international research literature are increased productivity, improved accuracy of information, enhanced flexibility and mobility, more time to focus on business and the benefits of developing data-sharing networks.

A comprehensive building product data resource would have many direct applications for:

- building design
- product identification and specification
- processing building consents and later automating them
- building information modelling (BIM) – a 3D modelling approach that allows efficient planning, design, construction and building and infrastructure management by architects, designers, engineers and other construction professionals
- importing, manufacturing, supply and retail
- procurement and purchasing, including category management, where organisations make their procurement more efficient by managing and separating out their expenditure into groups of similar or related products
- warehouse management and distribution
- logistics, sales and warranties
- ensuring compliance
- informing whole-of-life building management and maintenance systems
- research and analysis.

The economic benefits could also be substantial. Economic research from around the world has already shown that the availability of digital product data can increase productivity and reduce unnecessary costs to the sector. For example, recent BRANZ research estimated the annual cost of non-conforming building products to New Zealand is $232 million (for residential and commercial construction) and that this problem could be addressed using a centralised digital product catalogue. The research found that a lack of trusted digital product assurance data was one of the factors influencing the use of non-conforming products. Other international research suggests that moving the construction industry to digital ways of working more generally could lift productivity by 14-15% and reduce costs by 4-6%.

A sector's overall productivity can be lifted without needing significantly more investment when companies and organisations update their work processes to start using new technologies and ensure they have staff with skills relating to these technologies. If this is done in a collaborative, transparent way using standards for data that are open and available to everyone, international research shows that the gains in productivity in one sector can spill across into other industries too.

Recent work by the New Zealand Institute of Economic Research (NZIER) explored the economic benefits from existing case studies about investment into similar problems and solutions (Table 1). NZIER concluded that, if 10% of the estimated benefits could be achieved, the economic reward would be substantial.

Building a digital building product data resource

Ideally, an information resource on building products would include:

- trusted product data accessible to all
- technical information that is comprehensive enough to describe each building product fully and usefully (also known as a 'digital twin')
- data that is managed and structured to be consistent with global, openly available standards for datasets about building products (unless there is a compelling reason to develop a New Zealand standard)
- commercial product assurance data, such as certifications, fitness-for-purpose claims and safety data sheets, including trusted identification of the data supplier
- other information that is valuable to the sector (including government organisations)
- a structure for storing the data that is easily expanded if needed
- an agreed set of basic metadata – this is information about the data that helps manage it consistently, describes what it contains and how it should be collected, stored and shared, makes sure the dataset can be searched and records found easily (naming and keywords etc) and has other useful information such as who collected it and when, copyright holders, public licensing and conditions of use (having good-quality metadata makes it easier to find, understand and use datasets)
- different systems in different organisations can easily connect to, read and exchange data (known as an interoperable ecosystem or infostructure).

Issues to overcome in New Zealand

At the time of writing, the New Zealand construction industry lacks consensus about implementing standards to structure and share digital data about building products in New Zealand. The idea was recently presented to government in a Cabinet paper but was not supported as concerns were raised about how this sort of resource could be kept up to date.

One of the main issues is that coordination and agreement would be needed between the stakeholders in the construction industry, many of whom are often competitors. This type of resource would provide benefits

Table 1. NZIER summary of benefits. (Source: NZIER, 2020)

BENEFIT	MODELLED VALUE	IMPORTANCE OF DIGITAL PRODUCT DATA RESOURCE
20% uptake in digital tools	$120m–$220m p.a.	Critical to deliver interoperability between systems
Product compliance	$23m p.a.	Important to deliver interoperability, data standardisation and readily updatable information
More complete product inspection documentation	$33m p.a.	Provides standardisation and mobile retrieval
Enable BIM* for construction and assets management in local government	Millions saved annually by local government	Critical for interoperability, standardisation and independent quality assurance

* Building information modelling, a 3D modelling approach that allows efficient planning, design, construction and building and infrastructure management by architects, designers, engineers and other construction professionals.

over time, but the industry would need to meet the upfront costs of collaborating and implementing any agreed system.

Recommendations

Governance and engagement

- The New Zealand building sector should take the lead and work together to find solutions for digital product data.
- Cross-sector engagement is essential to drive and enable the widespread adoption and implementation of standardised, structured building product data in New Zealand.
- For this sort of approach to succeed, leadership would be needed from a key industry stakeholder or stakeholders.
- Territorial authorities should be included in any industry collaboration as this sort of data standardisation would potentially support building consent processing and eventual automation.

Implementing a system

- A product library should be created and implemented, focusing initially on an agreed core set of product data attributes. The data should add measurable value and be useful across the sector (including government). It should be set up so that it is easy to expand in future.

- The product library would include basic product metadata and product assurance data.
- Agreement should be reached on:
  - a metadata standard
  - a classification scheme of product types
  - templates for product attributes
  - a template for digital data collection.
- International technical standards should be adopted for capturing data so that data sharing with overseas parties is seamless, as many products are traded around the world (unless there is a compelling case to use or develop a New Zealand model).
- The technology to collect, manage and share product data is already widely in use in other supply chains. Lessons for implementing this in the construction sector can be learned from following what has been achieved elsewhere and in other countries (Figure 1).
- Once the data structure is agreed within industry and available data structured and standardised accordingly, it can be shared across the industry.

Maintaining the system

- The research recommends adopting a not-for-profit, cross-industry governance group leadership model rather than having the product data managed by a business unit in an agency.

- Ongoing incentives would be needed to ensure any data collection and storage systems are managed and maintained over time. Incentives include:
  - product suppliers would avoid non-standard data entry costs and duplication of records
  - businesses that provide specialist data and IT services to the construction sector would avoid data collection and compilation costs while developing new ways of using the data to better serve sector and customer needs.

More information

BRANZ External Research Report ER56
Digital product data for lifting productivity

BRANZ Research Now: Technology #1
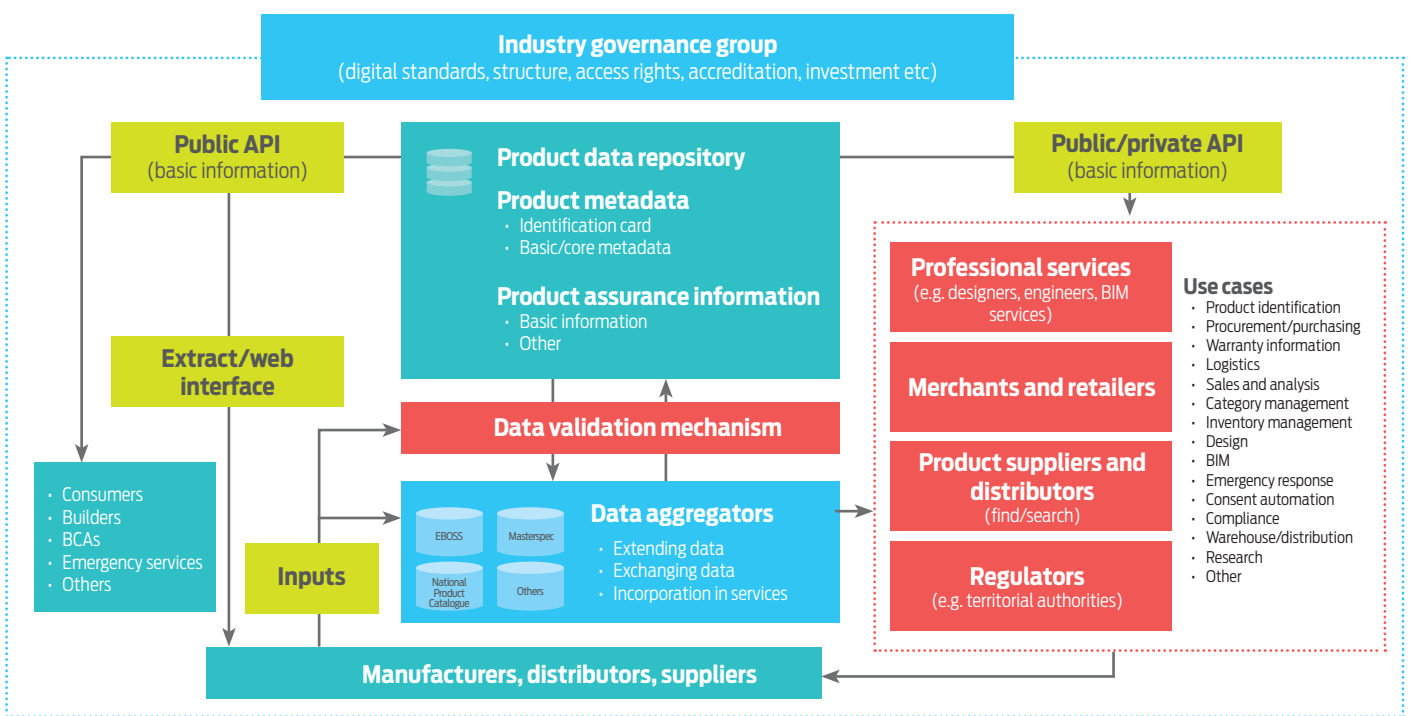*Electronic traceability: feasibility*

Figure 1. System supporting a product library of standardised data for the construction industry. Note: An API (application programming interface) is a software interface to allow two computers or computer programs to communicate with one another.