Digital Transformation with OpenBOM

CIMdata Commentary

Key takeaways:

- *OpenBOM's cloud-enabled solution facilitates a company's digital transformation by sharing data across independent silos.*
- *The Bill of Material (BOM) and product configurations are at the core of the product development process and current spreadsheet implementations hold companies back.*

In today's highly competitive marketplace, customer demands are driving product developers toward more customizable products. This level of complexity puts pressure on product engineering's ability to create and manage more multipart product configurations. Central to product development and the processes surrounding manufacturing is the Bill of Material (BOM). Yesterday's solution of a spreadsheet to capture a product's BOM and those of its numerous variations is holding many companies back and impacting their bottom lines. The OpenBOM (www.openbom.com) solution of a cloud-enabled BOM bypasses the limitations of a file-based spreadsheet with its ability to support complex configurations across geographically distributed design and manufacturing sites. CIMdata's targeted research and industry experience strongly upholds this view.

Today, the most common tool to define and manage a product's BOM is a spreadsheet. While the product BOM is at the core of an effective product development process, a spreadsheet implementation carries with it heavy liabilities of out of date data and error-prone human edits. Changes authored in one location may be late in being communicated to other sites or may not be communicated at all.

The reliance on a spreadsheet is further complicated by the heterogeneous nature of product development tools used in partner companies and in the company's supply chain. Each contributing player may use a different PDM solution for their internal work. The same may be true of the lead product development company itself with design engineering and manufacturing having different systems. Developing and maintaining interaction between each of these systems and a singular, up-to-date BOM spreadsheet is difficult at best. The speed of distributing BOM changes and the coordination between manufacturing sites is critical.

Access to OpenBOM

OpenBOM currently targets their solution towards small to medium business (SMB), suppliers, partners, and small OEMs by providing a collaborative design sharing environment for complex assemblies without dictating a specific PLM solution suite or PDM system be used. With OpenBOM's cloud-based BOM all geographically distributed stakeholders can share the most up-to-date product information in real-time, and without the requirement of an on-premise IT infrastructure. Sensitive to entry cost, OpenBOM's low cost provides easy justification and use in trials, pilots, and small-scale deployments.

Users gain access to OpenBOM through the OpenBOM dashboard web page (Figure 1). Browsers Chrome, Firefox, and Safari are currently supported. Users can create BOMs directly within OpenBOM or import existing BOMs from spreadsheets or part catalogs as spreadsheets. In addition, CAD users can export BOMs into OpenBOM directly from within their CAD solution, including cloud-based CAD tools such as Autodesk's Fusion 360 and

Onshape, Inc.'s Onshape, using an OpenBOM plug-in. Given their emphasis on SMBs today, out of the box plug-ins are available for:

- Altium LLC's Altium Designer
- Autodesk's Fusion 360
- Autodesk's Inventor
- Dassault Systèmes' SOLIDWORKS
- Kubotek's Key Creator
- Onshape, Inc.'s Onshape
- Siemens PLM Software's Solid Edge

Because of their success with SMBs, OpenBOM's management indicates they are seeing a growing interest from larger companies and are now exploring future integrations with high-end CAD, PDM, PLM, and ERP solutions. While a SOLIDWORKS PDM integration is available out-of-the-box, others are available as a paid service. OpenBOM can also be integrated with MCAD and ECAD systems such as CATIA, NX, Creo, Cadence, and Mentor Graphics. These and other custom integrations are available as paid services.

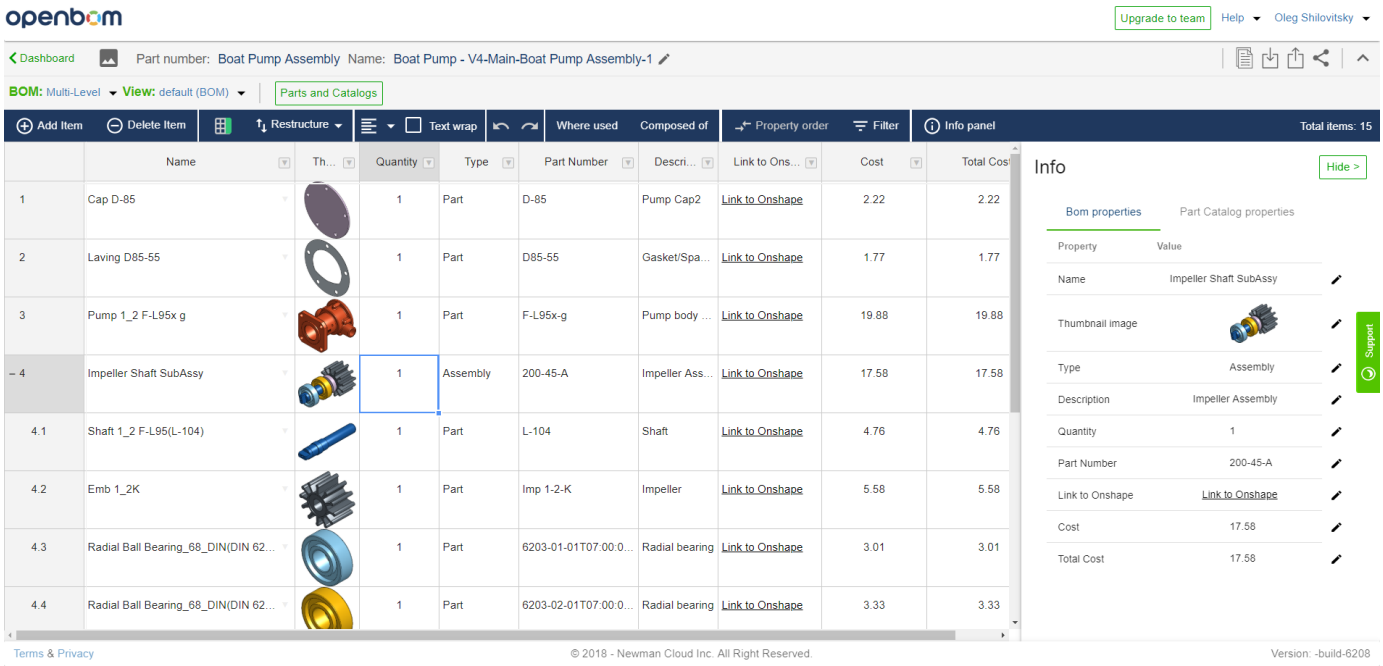

Figure 1—OpenBOM Dashboard Display of BOM
(Courtesy of OpenBOM)

Once a BOM is in OpenBOM it can be continuously updated. CIMdata recognizes this as an important capability since it allows users who currently rely on MS Excel spreadsheets for their BOM support to maintain some portion of their existing processes while they transition to OpenBOM tools at their own pace.

A BOM in OpenBOM can be exported in either Excel, CSV (comma separated values), or PDF formats. OpenBOM also provides access to data via REST API (REpresentational State Transfer Application Programming Interface) available for subscribers. Users can integrate their OpenBOM data with cloud file storage systems. In effect, the BOM can be cloud-enabled using the user's existing account for Dropbox, MS OneDrive, Google Drive, Onshape cloud storage, or Autodesk's A360 Drive cloud storage.

BOM Properties

Tools allow users to customize a BOM by adding or deleting items and add properties and values as well as formulas. Properties are data attributes associated with component parts and assemblies. In OpenBOM they can be Public or Private attributes. A Public property may be created by any user registered to OpenBOM. That Public property can then be used by any other user registered to OpenBOM and cannot be duplicated. A Private property may also be created by any user registered to OpenBOM in a Property Table and is accessible only by that user and any user with whom the Property Table is shared. Part Number is a default Public Property generated with every new BOM.

Within OpenBOM properties are displayed in the dashboard as a matrix similar to a spreadsheet where the Property name is the header and property values displayed down the column for each component in the BOM (see Figure 1). When a BOM is exported to OpenBOM from a CAD system, all its properties are also exported. The user can add additional properties or modify their values.

Part Catalogs

The OpenBOM solution delivers an added bonus to users with the implementation of named Part Catalogs containing information about Parts. A default Part Catalog is automatically created for each OpenBOM user. Once created, a user can assign multiple catalogs (or inventories) of parts to a BOM and control which Properties are added to the BOM. CIMdata sees the OpenBOM Part Catalog concept as a boon to project teams who can work with a shared set of resources.

BOM Types and User Defined Views

OpenBOM supports multiple BOM types: single-level, multi-level, and flattened. It provides flexibility in modeling hierarchical product structures and calculation of quantities across multiple levels. User defined view is a feature allowing the OpenBOM user to define what properties to preset in each view. This capability is useful for people in the organization as well as contractors and suppliers who have a different perspective of the BOM.

Strategy

At OpenBOM, the leadership views the product development landscape as built upon four centers of interest depicted in Figure 2. The first is analog data composed of 3D CAD models and 2D drawings, together with other specifications related to the models.

The second is digital process information and workflows of how the product is designed and manufactured. The third center of interest is the manufacturing value chain across product partners and suppliers. The final center delves into the intelligence that can be generated from the data to assist in decision-making. The four come together to start the digital transformation of product development companies.

CIMdata believes OpenBOM has identified the correct four aspects of innovative product development in an ever more complex world. Companies that can effectively unite data, process, and the manufacturing value chain through the central concept of the product BOM can leverage the intelligence gained from their interaction to produce winning products. Any product manufacturing company that struggles with maintaining accurate product BOMs and especially those that work with partners and suppliers would be well advised to look at OpenBOM as a possible solution.

Figure 2—Starting Digital Transformation
(Courtesy of OpenBOM)

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata's services, visit our website at http://www.CIMdata.com or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0) 495.533.666.