

Electronic Product Data – Too many formats!

1 INTRODUCTION

Business processes in all domains and especially in electric/electronic industries are increasingly being conducted electronically, which has significant impacts for manufacturers in CAPIEL's scope.

Delivering electronic data describing our offers is becoming mandatory to support ecommerce activities of distributors, design activities where CAPIEL products are used, and also to ease information exchange for other purposes between the actors of the electrical installation and the manufacturing industry.

To support the necessary information transfer, the use of shared common concepts between stakeholders in the value chain is necessary in order to simplify the process of generating and delivering data sets, and to support error-free information sharing.

The current situation is not satisfactory, mainly due to multiple emerging formats developed by various distributor organisations, CAD system providers and domain specific engineering solutions like BIM. Geographic aspects also play a role: in different regions of the world, different standards are relevant.

This document outlines the situation for CAPIEL manufacturers; the intent is to make our member companies aware of the upcoming changes in the industry, to describe the current standardization landscape, and to give some recommendations how to handle the situation inside the company and also with customers. Target audience is CAPIEL manufacturers, who face the problem today and want to prepare for the future.

In this document, the term *manufacturer* refers to the manufacturer of products that is delivering electronic product data and the term *customer* as a stakeholder that is requesting these data and integrates them into his business processes.

2 TYPES OF DATA

2.1 ELECTRONIC PRODUCT DATA

Electronic Product Data in this context refer to all kinds of digital information that are linked to our products and services (maintenance, assessments, etc.), and that are mostly provided by the manufacturer of the product.

This includes the following types of data:

- *Properties with their attributes* are structured data items like dimensions, technical data, EAN code, communication protocols & parameters etc. A property consists of several attributes such as a preferred name, a value format that can be linked to a dimension unit (e.g. *width in mm*) and a list of values. Both names and values may be subject to translation into different languages. In addition, unit conversions are possible. For example see the property [ACE429](#) of IEC CDD.
- *Documents* are unstructured content gathered in a human-readable file, e.g. a datasheet or a user manual. *Documents* are subject to translation into different languages.
- *Pictures* are photos or graphical representations of the product (or related aspects). There are often requirements to *pictures* like resolution, maximum file size or photographic aspects (background, viewing angle, illumination etc.).
- *Other file-based information* can include engineering elements (ECAD symbols, 2D/3D mechanical models, etc.) that are not human-readable and usually are imported into another tool (e.g. CAD software).

2.2 ENGINEERING DATA

Engineering Data includes product data for

- Electrical schematic design
- Configuration management: composition rules (multi-products, accessories, firmware)
- 3D assembly design, e.g. control panel or electrical distribution board.
- Building design (BIM)
- Plant planning
- Thermal simulation of an assembly
- Automation design (PLC programming): device profiles including state chart
- Automation functional design: application function blocks (e.g. motor control, energy monitoring, maintenance, safety control, security access), distributed resources
- Virtual commissioning of a machine e.g. with robots
- Asset management, traceability, lifecycle management
- Environmental impact assessment

Engineering data are currently using different formats depending on the software tools used by the customer, not allowing the reuse of the engineering results in other tools.

There is an urgent need to limit the proliferation of these new formats by launching standardization project for engineering data. eCI@ss has already developed standard formats for 3D geometry, terminal 3D position and capability.

2.3 DATA FOR COLLECTIONS OF PRODUCTS, ASSEMBLIES AND SYSTEMS

CAPIEL manufacturers are generally supplying individual products. However, electronic product data can also be applied to collections of products (a set of products that are still separated products but delivered as one package), assemblies (a set of products that have been assembled together, e.g. a contactor with an overload relay) and systems (a complete solution that is engineered and assembled to customer order).

Currently, there is no standard way to “package” data for assemblies & systems, this is defined case by case. For example, shipping lists for logistics have different data sets than for maintenance plans. Software tools for panel design are creating specific engineering data set for which new data models should be standardised for allowing the panel builder to make his design data set sustainable (portable to other tools or new releases of the tools).

2.4 OUTLOOK: ELECTRONIC PRODUCT DATA FOR INDIVIDUAL PRODUCTS

Up to this point, product data were describing *product types*, i.e. common data formats for all products of the same type, as it can be found in a product catalogue.

In the age of digitalization, there will be an additional focus on *product instances*; manufacturers will be asked to provide data for each individual product.

This data can include a serial number for each individual product, documents about its life cycle in production (e.g. quality test results), and also data that a product might produce during its operation (measured values, counters, service intervals etc.).

With this request, manufacturers are facing new challenges: the products need to be registered individually, and the amount of data collected can potentially be vast.

3 TARGET GROUPS FOR PRODUCT DATA

3.1 DISTRIBUTORS

With point of sale increasingly being made on distributor’s websites. Distributors are requiring product data for building their online catalogues and internal business systems according to their own format.

Distributors have a big influence on the choice of their customer by showing differences in the presentation of the assortment; quality and completeness of electronic product data are therefore a key differentiator.

Clearly an agreed common data formats is needed.

3.2 INSTALLERS & DESIGNERS

Installers, contractors and designers are requesting data under the different formats of their engineering, application programming, quotation and maintenance software.

Often, this target groups requests data in a format that fits directly into proprietary engineering tools (e.g. EPLAN or Autocad), so they can be used directly in the engineering process. Data exchange between these systems is usually not possible. Supplier of engineering Software are collaborating more and more with the machine manufacturer to reduce the costs across the engineering lifecycle and the transfer to the

production process of the panels. The integration of the Engineering software and the production machines helps to decrease the costs of panel builders, increase their flexibility and reduce the delivery time. Nevertheless, these solutions are customer specific and optimized on the portfolio of the tool supplier.

Installers and designers are using the Product data with their software tools to describe and design specific solution. Then they must produce the documentation of their solution using the data from the supplier. A high data quality is therefore essential.

More and more production processes are automated by parameter settings using the data from the product supplier. E.g. the dimension of a pushbutton is essential for the setup of a drilling machine for cutting the hole in the front door of a panel.

3.3 END USERS AND MAINTENANCE

End users are requesting a wide range of data formats for procurement, engineering and maintenance software. The requirements of the end users are driven by the purchase departments and so the data are often similar to those for distributors.

The data for engineering and maintenance are usually used in these software systems in their unique format. Consequently, these data cannot be exchanged between maintenance systems and the user is dependent on these engineering systems, their update processes and their new releases.

This is why new standardised engineering data models need to be developed. This is included in the ISO/IEC project called smart manufacturing.

4 REGIONAL DIFFERENCES

Electronic product data are subject to many activities around the globe. These activities are very often driven by wholesalers and end users. Their motivation is to have a common data model to select, identify and handle products in IT systems. This IT systems are used for logistics, trade (purchase) and engineering. The requirements of the different groups of interest and even countries are different, and this is resulting in many data formats and standards.

Global business is also a driver for the standardisation of Electronic Product Data and be dependent on the exchange of Product Data in a global business.

Here an overview about the organisations and the different standards around the globe.

4.1 EUROPE

In Europe are several activities driven by end users, wholesaler and industry organisations and (non-) governmental organisations. They are focused on their specific demand of their business. There are a lot of cooperation's between the different standards and organisations. Most standardisations and data provided are created by non-profit organisations in Europe. The most import ones are:

ETIM: ETIM (Europäisches Technisches Informationsmodell / European Technical Information Model) is an international classification model for technical products for the fast and smooth exchange of data between manufacturers and retailers. This model is created by an association and specialised on electrical engineering and similar branches. Founded in Germany ETIM became an international standard during the last years. It is used in all member states of ETIM international for the electrical sector. ETIM is mainly used in Europe, but there is a large number of user organisations, too.



ETIM is multilingual, media neutral and supplier neutral format. The list of classes is available on this ETIM page: <http://prod.etim-international.com/>.

Participating member countries (with national organisations): Austria, Belgium, Denmark, Finland, France, Germany, Italy, Lithuania, Netherlands, Norway, Poland, Spain, Sweden, Switzerland, UK, USA and Canada. In some of these countries the organisation is not represented as ETIM itself but by other national organisation that use this classification model.

ETIM allows the flow of data to be standardized due to the same catalogue basis for all parties and also to distribute the article information between different countries. With ETIM, all parties use the same product and catalogue data basis and thus avoid the necessary data formatting and adaptation. With the help of the classification similar products are ranged in an existing class defined by technical data. The focus is on electrical and sanitary trade. ETIM is a non-profit organisation and its standard is free to use without any license. The organisation cooperates with other organisations like ecl@ss, proficl@ss international, PI, ZVEI, VDMA and building smart.

BMEcat: BMEcat was founded by the “Bundesverband Materialwirtschaft, Einkauf und Logistik e.V.” (BME), the leading trade association for buyers, supply chain managers and logisticians in Germany and continental Europe. BMEcat is an XML-based standardized “delivery format” for catalogue data in the B2B area. It is the main format used to deliver the ETIM and ecl@ss data. BMEcat makes a significant contribution to product data management and provides a secure basis for dealing with intangible information and data along the supply chain. BMEcat cooperates inter alia with ecl@ss.



eCl@ss: Interdisciplinary product data standard for the classification and clear description of products and services. ecl@ss has established itself as the only ISO / IEC conform industrial standard nationally and internationally.

In addition to the classic applications in procurement, controlling and sales, ecl@ss also demonstrates its special strength in the use of the cross-company process data management and engineering. ecl@ss has today the most global approach and is linked to several other initiatives all over the world.

The classification ecl@ss provides is a four-level hierarchical system to group products and services. The non-profit organisation was founded in 2000 by several leading German companies (in contrast to ETIM). Members of ecl@ss are companies, associations or corporations.

ecl@ss has a headquarter in Germany and several international offices in China, France, Austria, Egypt, Switzerland, Portugal and Spain.



proficl@ss: *proficl@ss* is a non-profit organisation that classifies product data interdisciplinary as ecl@ss does (ecl@ss classifies and describes products and services, proficl@ss classifies the product data). The standards are created in corporation of manufacturers, business and associations with a special focus on commercial buildings. The members of proficl@ss are trading companies, craft associations, industrial associations and organisations. The aim is to allow electronic trade across different branches thanks to consistent classification standards. proficl@ss wants to assure an efficient creation of catalogues for an internet-based usage, print catalogues and e-shops. It cooperates with ETIM, ecl@ss, baucl@ss and DIN Merkmalsserver.



NAMUR: NAMUR is an international association of users of automation technology in the process industry. The organisation supports the interests of users and is in on-going dialog with the manufacturing companies. It creates recommendations and worksheets for its members which can also be provided in standardisation bodies as a proposal from a user's point of view. Content of these could be how to reduce costs, make work safe and other requirements. The work of NAMUR is focused on products and machines for the chemical sector but there are some other working areas and partnerships as well. There is a strong cooperation between NAMUR and other associations that represent the user's interests. There are at the moment no activities on Product Data known. Many of the member are supporting and driving the eCl@ss activities in parallel.



Odette: ("Organisation for Data Exchange by Tele Transmission in Europe") Odette is a pan-European cooperation and service platform for the entire automotive network. Odette's goal is to bring supply chain professionals and technology experts together to create standards, develop best practices, and provide services that support logistics, e-business communications, and engineering data exchange around the world. The task is to raise efficiency and increase the competitiveness of the European automotive industry within the global economy.



Odette provides several supply chain tools such as containers, bar-coded labels, file transfer protocols and EDI messages. Regarding electronic product data, Odette is focused on data exchange via portal and EDI.

For Non-Production Material they define a set of identifier to preserve accurate and useful product information.

The non-profit organisation represents users in all areas of the automotive supply chain. Odette's members are (mainly European) organisations within the automotive industry. Member organisations exist in the Czech Republic/Slovakia, France/Monaco, Germany, Spain, Scandinavia (Sweden) and the UK. Turkey and Italy are only associate members.

Electrocod (Italy): METEL aims to offer the market a unification of the creation and management of documents related to the order cycle. It focuses on data exchange between manufacturers, wholesalers and trading partners via EDI and is the Italian representative of ETIM.

4.2 USA

In US and Canada are providing Data Management on customer demand. Very often they use IDEA standard with is the most common one used by wholesaler.

IDEA: IDEA (Industry Data Exchange Association) is a for-profit company that provides applications and establishes standards for an efficient business process through the whole supply chain in the electrical industry. The focus of the IDEA's work is on the e-commerce. As IDEA is a for-profit company it is difficult to find out who they work with and in which countries are represented. IDEA is used from hundreds of distributors in the US/Canada and is the de-facto standard in the US/Canada.

IDEA is an official member of ETIM International, representing the US and Canada. An IDEA-led ETIM Committee was formed to help create a translation/adaptation of the ETIM model to North American English. ETIM was designed for the European market and their data needs and regulations, which are significantly different from US and Canadian needs. ETIM International strongly supports IDEA's efforts to translate and identify areas where their model is missing North American product information, regulatory and certification requirements, etc. and then submit requests to have them included in the official model. These requests will inspire the creation of a map between our North American ETIM adaptation, and IDEA's UNSPSC-based Classification and Marketing Description model (CMD, formerly the Electrical Attribute Schema).

4.3 ASIA PACIFIC

ecl@ss: As mentioned above, ecl@ss has an office in China and India and is starting its work on standardisation there. By giving some seminars for members and non-members they try to recommend their system. There is no information about in how far ecl@ss is implemented in the Chinese business.

5 MARKET FEEDBACK

5.1 RISK OF COMMODITIZATION

Manufacturers should consider the risk of “commoditization of the offer”, due to the availability of product and price comparators and selection tools that can compare the “smallest common denominator” of competing products but will not compare individual unique features of products.

However, product technical comparators already exist on the websites of the distributors, where customers can select products from the complete offer by using a subset of technical properties, ignoring the manufacturer brands of specialized features of the products.

Lack of industry or product specific standards on product data will let pure information technology players like Google or Amazon develop product selectors without sufficient domain knowledge.

As the evolution of product comparators is a major trend, CAPIEL is inviting its member companies to be more proactive in supporting development of content standards lead by manufacturers that include added value properties, e.g. in eCI@ss.

5.2 DATA CONTENT & QUALITY

Globally, customers complain about the poor availability and usability of data coming from the manufacturers and the lack of consistency between data due to no common format, repository & structure.

Distributors and wholesalers want rich content to improve the presentation of offers catalogue and the choice of their customers during the ordering phase.

Design offices want to facilitate exchange of information in the engineering phase with their customers and their suppliers. These are often domain specific, e.g. construction projects require other processes and data sets than a chemical plant.

End customers want to be able find easily spare parts, particularly in the maintenance phase.

Of course, each customer is requesting the data in a format that fits to his already existing tool infrastructure, which is often homebrew and not standards-based.

CAPIEL manufacturers should also note that the data quality is a continuous process, not a one-shot task. New products are introduced, old products are phased out, additional properties or documents are requested from customers or regulators (e.g. EU Declarations for Conformity, conflict minerals declarations or the China RoHS declarations).

In some cases, customers require much more information than it is required by regulation, as they anticipate future requirements. As an example: some customers ask for full material declarations of products, while that information is not available from most of plastic materials and electronic components.

5.3 UPDATE PROCESSES

Customers usually need to keep their datasets updated on a regular basis. For example, on a distributor website, the assortment needs to be updated with new products, old products have to be removed or put into a spare part section, new product features need to be included in the description texts, and so on.

Customer request different update cycles (monthly, quarterly, yearly), and different update modalities, for example a full dataset every year, and delta-datasets quarterly or when the manufacturer delivers a major update to a subset of the data (e.g. manufacturer introduces a new product line).

6 FEEDBACK FROM THE MANUFACTURERS, EXISTING SOLUTIONS AND MAJOR GAPS

Standards for describing the products and delivering datasets are existing, yet manufacturers are challenged with the inadequacy of the current description models:

- Classification schemes are often un-complete, absent or misleading
- Redundancies, ambiguities, products dispersion in different branches of a given classification
- Limited number of features / Offers properties (description)
- Poor translation capabilities, and also poor translations
- Missing product collections, assemblies or systems descriptions.
- Software capabilities and data capabilities on article level e.g. number of starts of motor starter is no provided by the standards today
- Engineering of Industry 4.0 solutions is still unique due to missing standards in functions, communication and services.

These standards offer very limited potential for differentiation.

Manufacturers have also to deal with multiple associations or groups of actors, and multiple & un-consistent formats (eCl@ss/ETIM, Prolist, Odette, UNSPSC, IDEA, ...). This generates complexity, cost and delay in time to market.

Update cycles are not always defined by the classifications organisations, so version control of the data sets is difficult to be managed. The classification or standardisation organisations are not offer Central databases with the latest and newest data sets. Manufacturers and consumers have to negotiate the schedule of the update cycles and the update procedures. Even using one defined format generates a lot of bilateral reconciliation requirements and workload.

Usually there are no quality checks really defined and each user defines his own.

7 RECOMMENDATIONS FOR INTERNAL SETUP FOR PRODUCT DATA

Enterprises today face more challenges than ever. Products are being commoditised faster. Customers continue to demand lower prices, better quality, increased customisation and higher service levels. And increasing government regulation and oversight are driving up costs and business process complexity. The globalization and speed of our business is also a major challenge for the data management of a company. The standardized data flow, the control of the product ranges and the worldwide access and distribution of the most up-to-date data are given strategic importance and are an essential component of efficient management.

Tackling these challenges requires continual real-time access to accurate master product data, which for most enterprises resides in multiple systems and in many different formats, both within the enterprise and in external suppliers' systems. Therefore, top-level awareness for the business-critical role of correct, comprehensive and high-quality product data becomes more and more important.

Typically, this requires a defined organisation for product data. A strong governance process needs to be implemented, setting all relevant internal as well as external standards for data management and data quality. Topics such as data governance and data stewardship should be defined in order to secure a stringent and governed process for data maintenance across different department and organisational units of an enterprise.

Organisations need to establish a single database as a single "source of truth" for all relevant product data and accompany this with common tools & processes to maintain and enrich product data at this single point of truth. By decoupling master data from consuming applications and business processes, a single, consistent view of that data across the enterprise and supply chain can be gained, without forcing every department, business unit or supplier to use the same application or data format. This results in faster decision making, improved responsiveness and increased business agility. The distribution of the available product data should become thereby also more efficient, since only one single source system needs to be considered.

Data Quality is an important overall aspect for product data management and should be considered as permanent goal and task. Completion, coverage, consistency, homogeneity, precision, actuality etc. should be measured in detail and constantly be secured – or increased if necessary. Internal standards should be established and lead to the development of the enterprise wide consistent and harmonised "data dictionary". Lessons learned from enterprise level should be collected and provided as input into the dedicated standardization committees.

A crucial success factor is also the involvement of all business functions which need to participate in data delivery according to their individual responsibilities. This must be secured along the entire information supply chain and should be strongly aligned and integrated into a broader product lifecycle management process. Organisational functionalities to be involved could be e.g. R&D, Engineering, Production, Logistics and Supply Chain Management, Product Management, Marketing, Category Management, Sales, etc.

Maintaining product data centrally and assign those data to all individual products on item level is already a challenge for the respective enterprises and their organisations. However, maintain the data is not the ultimate purpose. Even more important is a sound and effective functionality to distribute different relevant data sets into different receiving channels – this applies to internal channels as well as to external channels. The following chart indicates the general challenge:



By using standard data formats towards the customers or data receiving entities, the heterogeneity of data supplies can be harmonised, complexity can be reduced and the effectivity for data distribution can be increased. Members of CAPIEL should consider influencing standardization of data formats ecl@ass, IEC and other organizations.

All kind of digital assets become more and more important for commercialisation of products across all different sales and advertising channels. Digital assets (such as product pictures, instruction leaflet, manuals, application notes, engineering information, texts for request for proposals, white papers, brochures, all kinds of data sheets or documents, CAD data, software and firmware) needs to be considered as part of the relevant product information. Moreover, also regulatory documents such as approvals, certificates & declaration of conformity should be considered as well – even though the creation of those documents have to follow different processes. Also, this set of information needs to be centrally administrated and managed in order to provide the relevant sets of information to various different target groups.

Engineering tools are collecting different sources from many suppliers to design customer systems and provide the required documentation for the customer. From a regulatory perspective the evidence of compliance in even more complex solutions are an additional requirement to engineering system. Data exchange between the engineering systems will be essential for the engineering in the future. Using standards for input and output of data and the engineered solution are basic requirements for engineering systems of the future.

Is paper catalogue dead? No, only the way of publishing printed catalogues, brochures and advertising material will need to change and follow a different process. A central approach for maintaining and administrating product master data should always take into consideration to provide also the required data for printed publications. Given the increasing integrated and automated process for printed publication projects, typically the volume per editions decreases, the number of different printed publication increases as well as the frequency for updates.

Following these recommendations will allow an improved sustainability of the product data for both manufacturers and customers.

8 RECOMMENDATION FOR DELIVERING DATA TO CUSTOMERS

CAPIEL manufacturers will receive requests from the stakeholders listed in chapter 3.

As delivery of data in different formats multiplies the efforts needed, CAPIEL highly recommends the application of existing standards for this purpose.

For Europe, this suggests to use BMEcat as a transaction file for encapsulating ETIM/ecl@ss formatted data and other data content. Customers might require ETIM/ecl@ss data in different versions (4.0, 5.0, ...), and the tools provided by ecl@ss allow these conversions both for data providers (manufacturers) and data users.

Customers can also contribute to standardization (e.g. ecl@ss change request portal), even without being a member, if they identify improvement suggestions.

It is vital that data providers and data users agree on the main principles of their collaboration:

- Which data format will be used for the exchange? BMEcat? Something else?
- What is the required update cycle for data? Quarterly, annual, or ...?
- How will updates of the dataset be provided? As a full dataset, or as an incremental set that include only changes?
- If incorrect data is detected by the data user or the data supplier, how will the correction be handled?

For data exchange with the *Building Information Model (BIM)*, both manufacturers and customers should agree on standard formats for the main properties for our product's attributes when they exchange BIM data; the level of standardization in BIM is not going as deep as in other formats.

Due to its "rich data model", CAPIEL considers ecl@ss has the most appropriate format to provide basic data into higher level description formats such as BIM.

9 STANDARDIZATION LANDSCAPE

9.1 OFFER DATA STRUCTURE IS A KEY

The exchange of offer data between companies, business systems, engineering tools and also control systems can run smoothly only when both the information to be exchanged and the use of this information have been clearly defined.

A minimum standardized framework of both the descriptions of the objects and the exchange of information is necessary to facilitate and speed up the exchanges.

For example, 30 properties for a motor starter description have been defined as a good compromise between cost of data management and the possibility for the end user to select the appropriate offer.

9.2 STANDARD DATA MODELS FOR CATALOGUE DATA

IEC is developing product data standards in the IEC Common Data Dictionary database ([IEC CDD](#)) according to IEC 6130. It is based on the data model called Part Library (PLib) according to ISO 13584-42 using the Exchange of Product model data ([STEP](#)) according to ISO 10303 series.

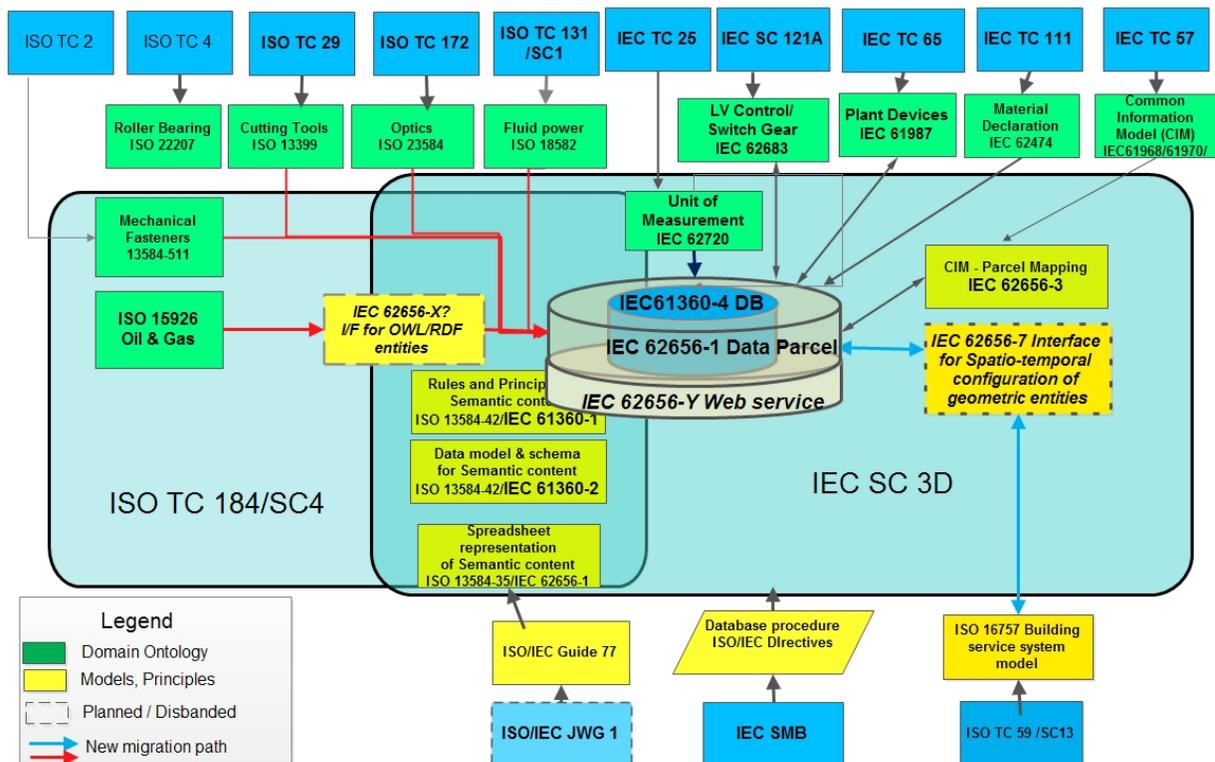
IEC CDD contains description of different domains: Electronic components ([IEC 61360-4](#)), process instruments ([IEC 61987](#)) and switchgear and controlgear ([IEC 62683](#)).

ISO product committees are currently requesting to be hosted in IEC CDD.

The international standardization is handled mainly in these groups:

- ISO TC 184 SC4 - Industrial Data
- ISO TC 184 SC5 - Interoperability, integration, and architectures for enterprise systems and automation applications
- IEC TC 65 - Industrial-process measurement, control and automation
- IEC TC121 - Switchgear and controlgear and their assemblies for low voltage.

eCl@ss data model is also based on ISO 13584-42 (PLib).



9.3 ETIM

ETIM stand for "Electro Technical Information Model" (or "European Technical Information Model"). The standard is managed by "ETIM e.V." (registered association). It is multilingual, media neutral and supplier neutral format. But it does contain definitions and its format is not ISO compliant.

The list of classes is available on the [ETIM CMT](#).

9.4 ECL@SS

eCl@ss is the biggest consortium. Over 3 300 companies worldwide are using eCl@ss standards. eCl@ss is one of the fastest deploying organisations.

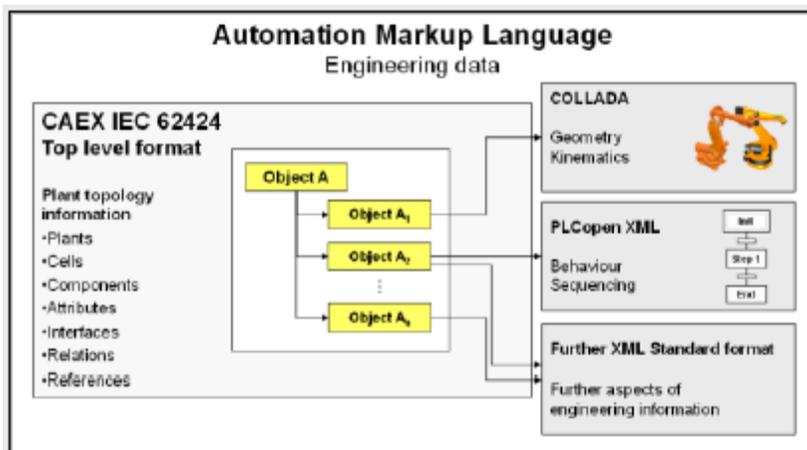
Its biggest value is a hierarchical system for grouping materials, products and services according a logical structure

eCl@ss data model is based on ISO 13584-42 (PLib)/ IEC 61360 (IEC CDD).

The segment 27 of eCl@ss 9.0 has a mapping to ETIM 6.0. The basic version, used typically for e-procurement or maintenance, has a flat list of properties and is called "Basic". The "Advanced version" is structured in blocks of properties and is parametric (conditions, cardinality, polymorphism, etc) and supports engineering data (former PROLIST e.V.).

9.5 AUTOMATIONML

A new standard IEC 62714 called AutomationML (IEC 62714), is providing a standardised approach of a common data semantic and object oriented for machine design. It also allows the aggregation of different data formats into one collection (one file).



10 TOWARDS A REFERENCE STANDARD FOR INDUSTRY

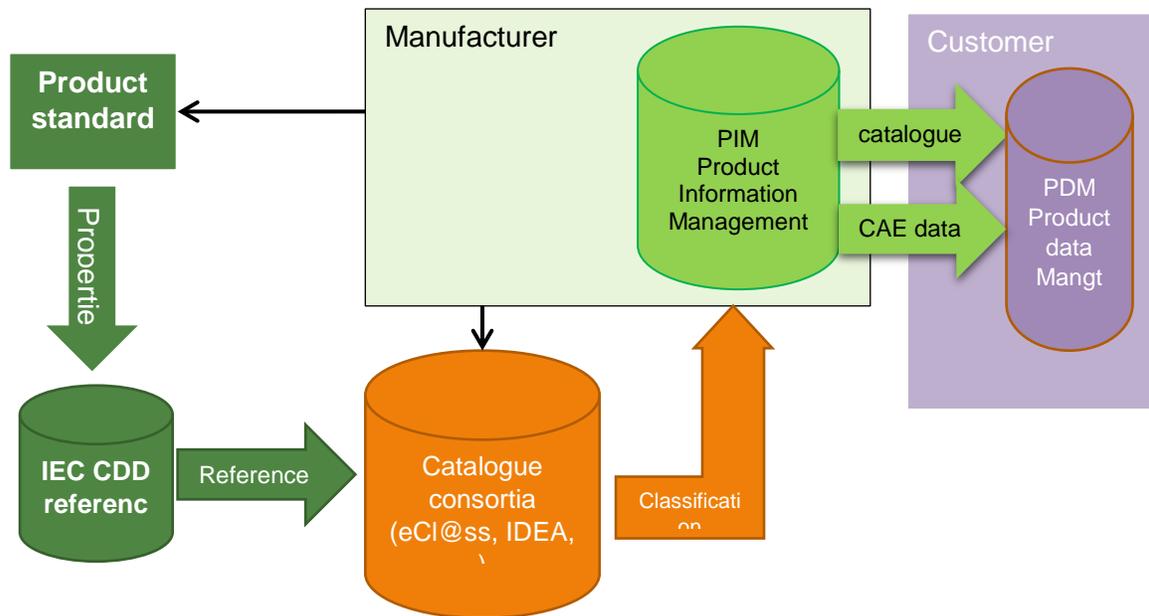
Globally, for the manufacturers, the main opportunity is to better value their offers by influencing the convergence of the various formats and to create meaningful, multi-language standardised ontologies for their offer (eCl@ss/ETIM, IEC/ISO). Finally, the content management cost will significantly reduce.

IEC CDD AS THE OFFER ONTOLOGY REFERENCE FOR CATALOG CONSORTIA

A proactive attitude is necessary to take over the current practices where IT departments and distributors are trying to convert quickly paper catalogues to databases without using a data quality approach (dictionary, homogeneous formats, inheritance, etc.).

Offer technical and marketing data should be managed by the manufacturers of electrical equipment to keep the lead of offer description process.

The relevant **product standards** shall be used as the reference for the **terms, definitions and key features** of the offer ontology.



At medium and long term, **data description structure** should be developed in **IEC CDD** (common data dictionary) to form the master database for electrical products. At short term, they can also be developed or corrected in the relevant catalogue consortium (eCI@ss/ETIM).

11 CONCLUSIONS

Summarizing, the following conclusions are relevant for CAPIEL manufacturers:

- Internal:
 - Prepare your internal organization for gathering, maintaining and delivering product data
 - Make sure your product data databases serve as *one single source of truth*, and prepare them to deliver output to many different downstream applications that use the data
- Towards Customers:
 - Educate customers to rely on the major product data standards for data exchange
 - Make clear agreements on exchange formats, update cycles, and processes for fixing errors
- In industry associations and standardization
 - Participate in activities around product data for your products

- Consider IEC Common Data Dictionary database as the referential
- Support ecl@ss by giving feedback on their classifications and attributes
- ETIM or other formats could be used when it is required.

ANNEX: RELATED INDUSTRIES WITH SIMILAR CHALLENGES

The challenges around electronic product data are not unique to the CAPIEL scope. Many industries that deliver “catalogue products” face similar challenges.

The following list shows organisations are also involved in driving the topic forward. CAPIEL stakeholders (manufacturers, national associations, and potentially customers) are invited to put the topic of electronic product data on the agenda whenever they meet.

OTHER MANUFACTURER ASSOCIATIONS

- CECAPI – Building Products
- CEMEP – Motors & Drives
- ORGALIME – Mechanical, Metal and Electrical
- EUROPUMP, EUROVENT

ASSOCIATIONS RELATED TO DATA USERS

- EUEW & Eurocommerce - European Wholesaler Associations
- CECIMO (European machine manufacturer association)

NATIONAL ASSOCIATIONS

Machine Builders: VDMA (DE), UCIMA (IT), UNM (FR)

INITIATIVES AROUND DIGITALIZATION OF INDUSTRY

- Platform Industry 4.0 (Germany)
- Alliance Industrie de la Future (France)
- Piano Industria 4.0 (Italy)
- D4M (UK)