



Squadra

Machine Learning Company



Smart Product
Conversion

The background image shows a person's hand holding a pen and writing in a spiral notebook. A laptop is visible in the bottom left corner. On the wall in the background, there is a quote: "THE ONLY WAY TO LIVE THE FULL LIFE IS TO LIVE IT ALL BUT OF MOMENTS LIFE IS A JOURNEY ENJOY IT".

Introduction

For suppliers, wholesalers and retail organizations who spend a lot of time and energy converting product information to their own structures and formats or to international industry standards (such as ETIM, GS1, Amazon or Bol.com), Squadra Machine Learning Company has developed the Smart Product Conversion tool.

This tool uses Artificial Intelligence algorithms to facilitate the conversion of product information to any chosen standard. By using the Smart Product Conversion tool, a huge amount of time and effort can be saved.



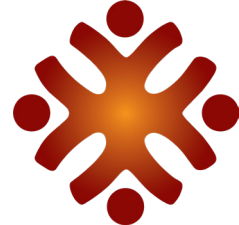
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Various Product standards

Current practice

The way consumers and companies do their shopping has changed enormously in recent years. More and more purchases are being made online and the buyer is becoming increasingly demanding. Large tech companies such as Amazon are increasingly gaining market share. Innovation at retail and wholesale companies is no longer an option, but a bitter necessity. These companies therefore focus on an omnichannel strategy: the customer is served via mobile, through webshops and in physical stores.

A condition for the implementation of an omnichannel strategy is the digital availability of product information in a Product Information Management (PIM) system. After all, through the online channels the customer must be able to find what he/she is looking for, and the customer must be convinced with this product information so that he/she makes the purchase. Think of the information about product functionality, technical data, the descriptive text for marketing and findability in the search engines, the correct classification into product categories so that customers can find the right products in a webshop, photos and videos of the product, etcetera.

However, much of this product data is not available in a uniform standard format or structure. There are industry standards for specific sectors such as ETIM, eClass and GS1 that can ensure that the entire chain "speaks the same

language". Market "standards" are also being created by large parties such as Amazon and Bol.com. Unfortunately, these standards are not yet used by all parties in those sectors and/or the standard is not suitable for a manufacturer's product set. In practice, it appears that many suppliers and wholesalers provide their products with their own standard: self-defined product classifications and self-defined product characteristics. The consequence of this is that a conversion from one standard to the other is required. This is often not a quick and smooth process. Manually matching features and classes can be very time consuming. And when it comes to many (hundreds of) thousands of products from many different suppliers, it can simply become an impossible task. There are some conversion tools available that offer some relief, but there too, a matching rule must be set per product category and per attribute. In both cases, the conversion is an intensive and time-consuming process.

The Long Tail

An additional challenge is to update product information of the products from the so-called long tail: products that do not have a high turnover rate. The fast-running products have often been digitized while the many products in the long tail have not. Updating large numbers of products to the correct standard is not only very time-consuming, impossible to do manually but to date has been difficult to automate.

ETIM is an international industry standard that is used in construction, engineering, sanitary, heating and electrical engineering sectors.

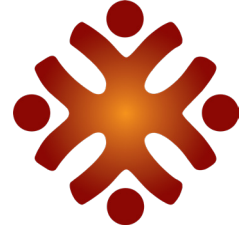
GS1 is used as a standard barcode in the Food and DIY sectors, among others.

Bol.com and Amazon are major players and have developed their own standards.

The use of standards streamlines collaborations, but is unfortunately not used by everyone.



“Uniform and manufacturer-neutral international standards greatly facilitate the collaboration and exchange of products and information between suppliers and retailers / wholesalers. However, practice shows that many organizations do not yet use these standards, resulting in time-consuming and labor-intensive manual conversion of product data.”



Our solution:

Smart Product Classification

As a specialist in the development of Artificial Intelligence, Squadra Machine Learning Company has developed a solution for these challenges with the development of the Smart Product Conversion tool. This widely applicable conversion tool runs on state-of-the-art artificial intelligence algorithms trained to predict the right class and recognize features from unstructured product description texts. This means that the conversion and onboarding of products becomes significantly easier and many intensive working hours can be saved.

How it works

The Smart Product Conversion tool supports the conversion of product data in two steps:

Product ID	Product Description	Predicted ETIM Class (top 3)/ETIM class description	Risk Level
1110767	stainless steel shower drain 1050 mm steel grate DREAM zu 50 mm incl. sealing mat	EC011720 - Shower drain	1
1110768	stainless steel shower drain 950 mm stainless steel grate DREAM zu 50 mm incl. sealing mat	EC011720 - Shower drain	1
1110777	stainless steel shower drain 800 mm incl. sealing mat	EC011720 - Shower drain	1

As a first step, the products are classified according to the product class of the standard to be converted to. The classification is based on Machine Learning algorithms, which can predict the correct product class based on a product description. Depending on the configuration settings, the algorithm returns one, two or three product classes that are most suitable for the product, along with a risk level that indicates the level of reliability of the forecast. This allows you to upload products in bulk, have the algorithm automatically classify the products according to product classes and only perform a manual check step for products whose algorithm was not entirely sure whether the correct product class was suggested. In practice, our classification algorithms achieve 80% to 98% accuracy.

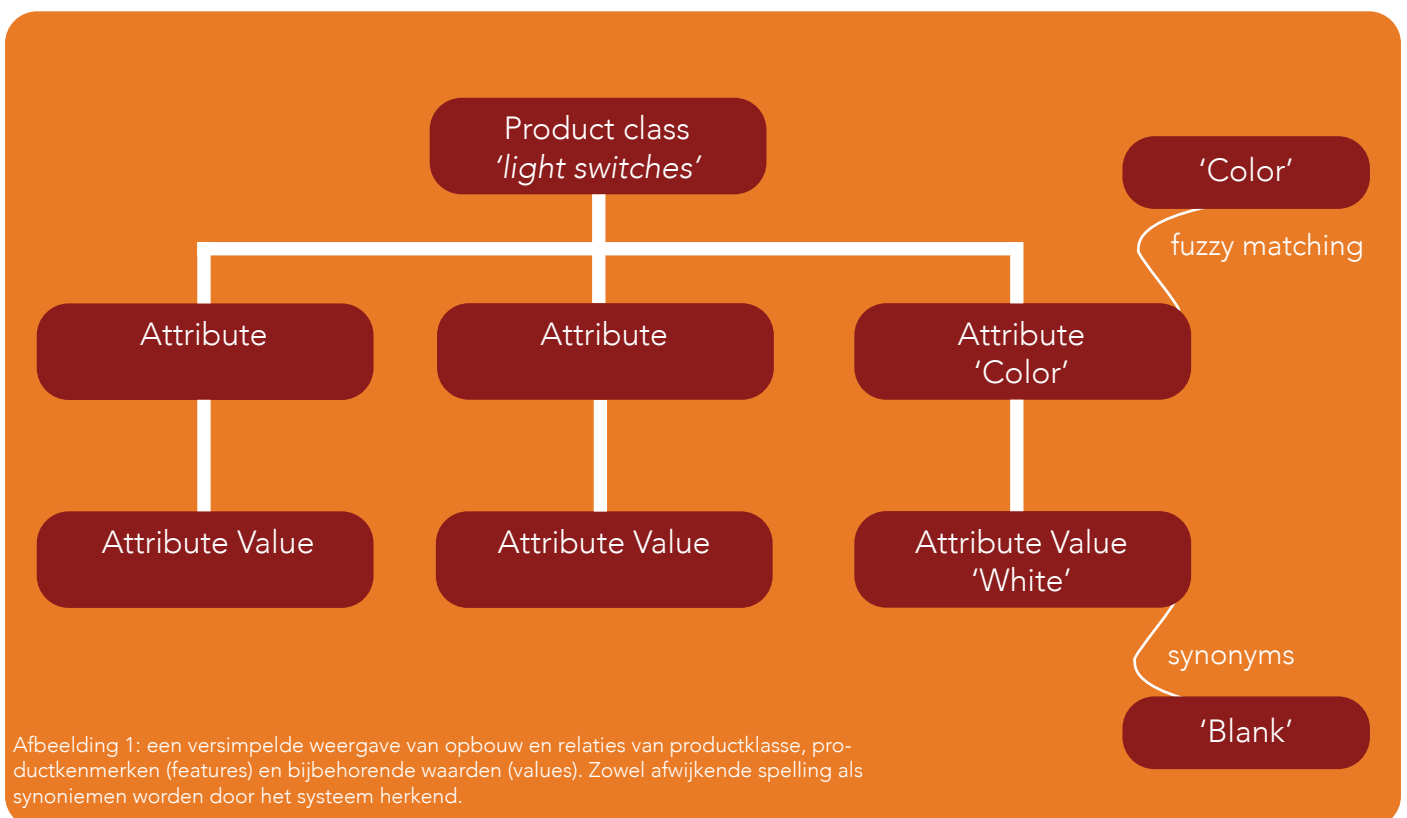
value	feature	unit	feature	unit	type	value
PVC, Plastic (2)	Material		EF002169 - Material		A	Plastic, Plastic (2)
Metric (1)	Type of thread		EF001758 - Thread type		A	Metric (1)
10.0 (1)	W	mm	EF000008 - Width		mm N	(1)

As a second step, the attributes and attribute values of a product are converted to the attribute names and values of the standard. Our smart algorithms are trained in various languages (e.g. English, Dutch, French) and use both mathematical fuzzy matching and Natural Language Processing (NLP) techniques to recognize similarities and synonyms, so that a correct conversion from one standard to another is proposed (see figure 1).

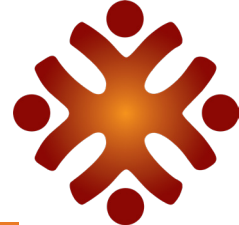
NLP is a combination of subject areas of linguistics and computer science and is very good at "understanding" texts such as product descriptions. As a result, it can even learn to deal with (company-dependent) abbreviations. Product characteristics and/or values that are spelled incorrectly or differently and synonyms can be recognized and matched by the system.



These smart algorithms actually learn just like the human brain does: based on enough examples, the algorithm learns what the 'essence' of a product description or class is. Once trained, the system is able to perform a correct classification on a new product example that it has never seen before. That is precisely why Artificial Intelligence or the more technical "Machine Learning" are increasingly popular terms because they are expected to cause nothing less than a global revolution.



Afbeelding 1: een versimpelde weergave van opbouw en relaties van productklasse, productkenmerken (features) en bijbehorende waarden (values). Zowel afwijkende spelling als synoniemen worden door het systeem herkend.



“With the **Smart Product Conversion tool**, we were able to **classify twice as many products** in a shorter time.”

Ultimately, an export yields a collection of converted products in the new standard. This export contains all processed mappings, the correct classifications and all (matched) conversions.

Due the Smart Product Conversion tool’s high precision rates it is possible to save up to 50% on the time that would otherwise be required to manually classify and convert products, saving many working hours in the process.

The Smart Product Conversion tool can be integrated with existing PIM systems via a REST API, offered as a stand-alone web application and/or be integrated in Microsoft Excel.



In practice

ETIM International (manager of the ETIM data model for electrical and electronic products) and FEST (branch organization for suppliers in the heating, air conditioning and plumbing market) have distributed the Smart Product Conversion tool with the aim of simplifying and accelerating the conversion to ETIM. This has ensured that partners can apply ETIM standards more smoothly and the conversion is streamlined.

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About us

Squadra Machine Learning Company is an innovative Dutch company that combines knowledge about business processes, algorithm development and data visualization with the aim of helping customers with machine learning algorithms and applying artificial intelligence. We have a passion for Data Science and Machine Learning in particular.



Our team

With a dedicated team of Data Consultants, Data Engineers and Data Scientists, we help our customers to automate various business and industrial processes, customer-oriented services and other data-driven developments in an innovative way. We offer services in the form of People, Projects and Products.



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