

New Approaches Towards the Delivery of Service Information Using Semantic Correlation Rules

Dominik Lächler^{1*}

¹ Christian Bürkert GmbH & Co. KG, 74653 Ingelfingen, Germany

Abstract. Knowledge about products and their applications, as well as how to use them, is often distributed in different places within companies. In the past, this has been an internally and externally accepted situation leading to time-consuming searches for required data. Nowadays, expectations of in-time delivery of information and the general view of knowledge processes as well as on associated data are changing radically. Traditional methods and approaches for storing, distributing and accessing information are therefore in many cases inappropriate and are questioned on industry-side. For example, in the domain of customer service of B2B products in machinery industry, it was common to communicate by phone with experts and help-desk-organizations, who provided the required information by experience or by informal information exchange networks. Under the pressure of digitalization and the constant increase in efficiency, as well as the demand of customers to obtain requested information more quickly, new ways of providing and connecting information are becoming increasingly relevant. It is still unrealistic to assume that all relevant information can be prepared specific to each target group and to each application within a short period of time. Rather, the challenge is to create and store information in the future in a structured way with meaningful semantic and consistent metadata and, on the other hand, to relate this new information to existing information in such a way that the user can be helped quickly and easily. Several preconditions are crucial to build up a new information infrastructure: First, management has to be convinced of the benefits of storage and intelligent search environments and to get support from relevant stakeholders. Subsequently, new information architectures require smart approaches for content authoring and metadata enrichment supporting information delivery via different media channels for relevant customer groups. Time and effort for setting up this new architectures has to be argued and justified..

1 Introduction

Dealing with information and the associated knowledge management is an ongoing topic in the machinery industry, especially against the background of increasingly complex products and a change in customer expectations. The hype around the topics of content management, delivery and ontologies is visibly being replaced by use cases that are becoming more concrete in order to approach the topic of knowledge management in a practical and structured way.

In this paper we deal with current issues in the industry with regard to the provision of preferably technical knowledge, which is classically provided as print documentation. We will discuss developments, basic approaches and ideas as well as use cases and concrete proposals for the implementation of end-to-end information logistics. We will also separate what is theoretically possible from what is realistically possible in the medium and long term. Furthermore, we will also take

a look at possible arguments to justify and implement investments and change projects in the field of knowledge and content management.

2 The way we look at information

In the context of digitalisation, private behaviours related to content consumption and processing are gradually being transferred to the new world of work. This creates patterns in terms of processes, methods and ways of working that require a rethink in the respective organisation. Today, if one expects a satisfactory answer in the first hits when searching for specific information on the internet using a search engine, this claim is asserting itself in industry with a time delay, but all the more vehemently. The term "Industry 4.0", which stands for a holistic change to linked processes in industry, has existed for a long time. Keyword: Smart Factory, Smart Products and Smart Content. Machines are supposed to talk to each other and thus, for example, automatically order required

* Email: dominik.laechler@burkert.com

spare parts or inform about a soon upcoming maintenance, which is not calculated statically but dynamically from the usage time, the conditions of use and the general condition of the machine [1]. At this point we focus on the area of "smart content" and explain what users increasingly expect from content and the provision of information in an industrial context:

- Easy access to information
- Up-to-date information
- Permanent availability
- Location-independence
- Display on common end devices

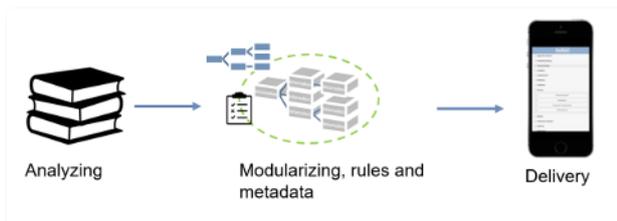


Fig. 1. Ideal approach for delivering modular content

And last but not least, the acceptance of content that is more "Product may vary" decreases.

This goes hand in hand with a whole series of requirements concerning roles, systems and data quality in general, which will be discussed in this paper.

3 Structured and unstructured data

With the introduction of content management and similar information systems in the field of technical communication, the focus is increasingly shifting to data quality and, above all, the way in which data is created. Basically, the requirements described above in the context of digitalisation require a shift from so-called "unstructured" data to "structured" data. From a technical point of view, structured data is structured in such a way that it is basically machine-readable, machine-processable and identifiable. An XML file can be seen as an example, which is based on an XML schema and to which metadata are assigned that provide information about what kind of information the XML file contains. Unstructured data are often documents in print formats such as PDF. The advantage is that any user can open them, but there is usually no classifying metadata and the content in the form of text is not structured as e.g. HTML or XML.

Structured data, however, is the prerequisite for any kind of continuous information logistics, but transitional forms are now becoming established that draw the connection from academic teaching to reality in companies and offer opportunities to develop intermediate forms.

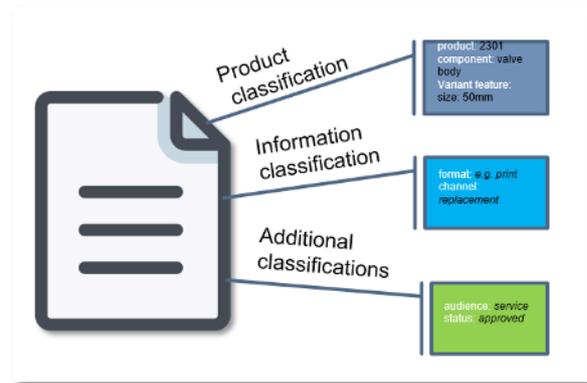


Fig 2. Example for structured content

4 Handling content of high-variant products

Recently, discussions in the field of technical communication have shifted from the perspective of "one product, one module" to the variant-specific production of corresponding content [2]. Overall, the handling of complexity takes on another facet in that not only the products and their complexity have to be handled, but also that of the corresponding content. Especially with regard to the provision of instructional information or service knowledge, this requires a rethinking of content creation.

This new dimension requires editors, service technicians and product management to view the information as what it actually is: part of the product and thus delivered exactly in line with the order. "Illustration similar" is becoming less and less accepted, as are page-long documents, when the information sought usually only consists of small information components. In the final analysis, however, it is precisely the handling of the smallest information units that is most demanding, because the so-called microDocs must also function without the classic document context. Experience from the process industry shows that the first modular level with product reference usually causes fewer problems and basic metadata concepts are becoming increasingly standard. Working on a subgranular level, however, i.e. working with feature-based documentation, forces the content creator to deal with the deepest technical details of the respective described device. It is no longer sufficient to use the component "housing" as a metadata for a module, but rather the concrete characteristic, e.g. with regard to the chosen material (e.g. metal or stainless steel), which has a concrete effect on the respective content and the application of the product. In this example, a manual would contain information that a product, because its housing is made of metal, is not suitable for use in the food industry or in the hygienic sector in general, whereas the stainless steel version is.

One can imagine that, of course, combinatorial dependencies arise between attributes of a product, which in turn cannot be evaluated by classic CCMS. As a result, in the field of technical communication it may be necessary to generate additional characteristics for products that create clarity with regard to classification on the editorial side.

5 External factors

The respective touchpoints expected by customers today have already been commented on in this paper. However, these customer requirements do not force us to change our editorial processes if we ignore the possible damage to our image and turnover. There is no legal obligation or standard that specifies how documentation must be created and designed in the context of digitalisation. This is changing with standards such as iiRDS and VDI 2770, which make concrete specifications for the labelling and structure of content. VDI 2770 in particular is gaining momentum with increasing acceptance and has a good chance of establishing itself as a documentation exchange standard in the process industry [3]. However, it has in mind that the ideal world of structured, classified data does not exist everywhere and will probably not become established in the same way everywhere. However, it is doing its part to further strengthen the basic acceptance of modular content, with limitations.

6 Using Semantic Correlation Rules

The author states that intermediate steps are needed, which on the one hand make content more accessible and only the essential content has to be consumed by the user, but the basis continues to be documents as partly unstructured data. The solution to this can be the Semantic Correlation Rules (SCR), whose use is intended for this purpose [4]. They are part of the Digital Content Chain and thus part of the digital transformation in the content and delivery context.

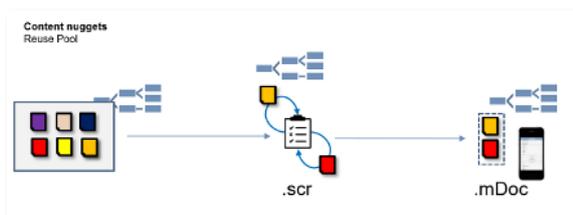


Fig 3. Content being used for microDocs by using SCRs

How do Semantic Correlation Rules work and what added value do they offer? They:

- aim to express the hidden experience of users and knowledge of relevant user groups (Service, sales, R&D)
- address the logical concept of microDocs as sharable knowledge
- describe correlations of information objects in a simple, but formalised and standardised way
- brings together structured and unstructured data
- use existing object metadata independent of specific content and explicit linking processes
- can be modelled in different system environments
- can be interpreted in search and delivery portals such as CDP

- use Use Cases as a base

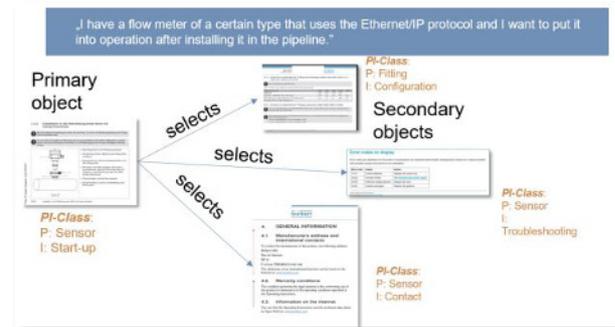


Fig 4. Use-case-based SCR rules

And finally, the start-up phase until existing, unstructured content can be upgraded with the rules is quite short. The creation of use cases is central, in order to reproduce exactly what the user expects in terms of content at the respective touchpoint.

6 Discussion and Summary

In this paper we have approached the challenges of industrial companies in relation to the future creation of content and its distribution and discussed problems but also possible solutions. However, the approaches are strongly dependent on the industry of a company (regulated vs. less regulated), its products and ultimately the respective customers. The topics discussed are therefore not transferable to the same extent to end products in the B2C sector.

In addition, the technical possibilities continue to develop; while content delivery portals were still a gimmick for experts five years ago, today they are developed to the point where they can contribute to the value creation of a company, for example by providing the customer with content in exactly the required granularity at the right time. However, the discussed upheavals do not take place overnight and not in every company at the same speed. However, it is undisputed that they are taking place.

In summary, it can be said that despite the constant professionalisation of the topics around content and its distribution, the people must not be forgotten. For the implementation of the measures described, specialists are needed, so-called information architects who model, build and extend e.g. SCRs and other concepts as part of the Digital Content Chain. And this necessity must be increasingly recognised in the companies.

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