"Semantify" Business and Content to Meet Demands for Expert Solutions in Professional Markets

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Abstract. Wolters Kluwer aims to provide professionals with timely, more informed, actionable expert insights which can be easily integrated into their workflow and daily routines. It is no longer sufficient to have content as the main focus of Wolters Kluwer solutions with semantics and metadata as secondary concerns. It has become readily apparent that content curation and business processes need to become more knowledge-centric, i.e., to "semantify" the content and the business. To semantify content, we describe how we have developed an enterprise upper ontology based on industry standards and have developed a process to make domain-specific extensions to that ontology. With regards to our business processes, we outline how we are driving a transformational change in editorial staff and developers alike to semantify content curation and development efforts. Providing knowledge-driven expert solutions requires both of these fundamental transformations; it is not sufficient to semantify content without also changing the way the business works, and vice versa.

Keywords: Knowledge workers · Expert solutions · Shared semantics · Business transformation

1 Introduction

Wolters Kluwer has been on a digital transformation journey for the last 15 years and is now focusing on developing expert solutions for our customers [1]. In 2021, over half of Wolters Kluwer revenue was from expert solutions, and it is expected that this will continue to grow [2]. To accommodate this evolution, we aim to provide professionals with timely, actionable expert insights which can be easily integrated into their workflow. However, it is no longer sufficient to have content as the main focus of our solutions with semantics and metadata as secondary concerns. There needs to be a shift to not just "semantify" the content, but also to semantify the business itself.

2 Semantifying Content

In order to meet changing customer expectations and to stay relevant in professional markets, changing how content is thought about and delivered is paramount. Professionals have little interest in reading mountains of documents returned in search results. They want answers to questions, and *actionable insights* delivered on top of traditional content. For example, a tax practitioner wants to know the 2022 tax rate for a client who owns a small business; a health practitioner formulating a clinical research question needs to find relevant research; an attorney needs to find relevant precedential jurisprudence that matches the unique claims and factual matters for a case [3].

At Wolters Kluwer, each of these use cases (among others) requires us to think of our content not just as simple documents with text or even as documents enriched with descriptive metadata. Rather, we aim to "semantify" our content. That is, to augment our traditional content with semantic knowledge, which can then be used to drive advanced features and actionable insights that customers increasingly demand. To extract this semantic knowledge, we leverage a combination of manual enrichments through editorial staff and specialized AI-based solutions.

To semantify our content in a standard, unified manner with shared, unambiguous meaning, we have built an enterprise upper ontology [3] based on W3C standards. In our upper ontology, we define properties and classes that are germane across all our content domains. And rather than reinventing the wheel, we make use of publicly available ontological standards and vocabularies whenever possible, such as SKOS, FOAF, Dublin Core and FRBR [4].

However, our enterprise upper ontology still cannot deliver the deep, highly domain specialized semantics required for different professional domains by itself. To resolve this gap, we have developed a process for creating and managing domain-specific extensions to our upper ontology. Our process involves direct consultancy between business analysts and the semantic knowledge engineers who manage the upper ontology, where we discuss professionals' requirements and determine a best fit for the situation at hand, e.g., to determine if a domain-specific extension is appropriate, or if perhaps the upper ontology should be extended based on a cross-domain requirement. By following this process, we ensure that our business units all take advantage of the shared semantics and common meaning defined in the upper ontology, yet are free to define additional semantics that are meant to fulfill the needs that are intrinsic to unique domain-specific use cases facing our customers.

As a concrete example of the adoption of this process we are currently developing a divisional content standard ontology extension for our legal and regulatory businesses, that enables us to further semantify the content from different business units in that domain on top of the semantic layer of the enterprise upper ontology for one modular legal expert solution platform.

Of course, this process does present challenges, specifically with regards to the needed business transformation explained in the next section. It has been a challenge to encourage content workers and software developers alike to focus on semantics and shared meaning, and thus to formally register that meaning in an ontology extension rather than simply inventing their own bespoke names for new properties in a simple spreadsheet to meet new requirements.

3   Semantifying the Business

Traditional content applications are mainly based on generic features such as content to be searched, filtered, ranked, and displayed. There is a clear disconnect between content creation and maintenance on the one hand and the application technology on the other. Information is ingested as content blobs where very few dedicated content features like search query parsing for legal entities are widely used.

Expert solutions, however, are more designed for specific recurring expert tasks of legal professionals like, for example, drafting contracts or legal analytics. Therefore, more domain information is processed, and this information needs to be more contextualised - and ideally - the content itself is directly driving functionality on the application side [5, 6].

More awareness and insights in the content is required if a product manager wants to define expert solutions' capabilities. This content knowledge is also helpful further downstream by platform architects and software developers who are implementing these capabilities. And in the end, content knowledge is even transforming the content creation process, with additional business requirements addressing content structure, enrichment, and frequency of delivery. This means that all stakeholders in the content process need to further develop and gain more knowledge about the content and data they are selling to customers as well as the customers' job to be done. In particular, those who have direct access to content creation and maintenance need to evolve from a purely content worker skillset to a knowledge worker skillset, including more knowledge about customer needs and how this impacts content. This is also true for software developers, who need to learn more about the result they produce – no longer an isolated piece of code, but a value-add functionality, directly driven by content capabilities, forcing them to evolve from software developers to expert solution developers. Additionally, business analysts who need to detail requirements to developers using common shared semantics as defined in the previous section.

One concrete example for knowledge worker skills is comprehension of how law sections are perceived with respect to granularity by the users so that we can build metadata on top of that perception, instead of simply copying and pasting from the source what the legislator is directly offering as a whole. In addition, expert solution developers are required to develop dynamic mechanisms for processing variable content entities that directly drive functionality, like dynamic browse trees or analytics capabilities on large and diverse volumes of data.

The overall business changes - based on more sophisticated and advanced customer needs - in turn drive and accelerate the organizational transformation that is focusing on informing and enabling all stakeholders about the impact of content driven customer needs for their own day to day work environment.

4   Conclusion

Semantifying content and the business culture by focusing on knowledge requires a transition from separate and disjoint roles to integrated understanding and contributions from knowledge workers. Integrating content creation and maintenance with application technology, as well as promoting shared understanding of the domain and content

knowledge enables expert solutions that are highly informed by customer jobs to be done and a seamless part of the workflow followed to complete those jobs. This change requires a modified methodology for presenting semantics for different stakeholders in a coherent and yet stakeholder specific fashion that still needs to be discovered by the research community.

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