The Legal Perspective on Business to Government Reporting – A Conceptual Modeling Approach and its Application in the Financial Sector

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Abstract

Business to Government (BtG) Reporting is a much-regarded research field, even more so since the collapse of the world economy. The topic attracts heightened attention from many financial service companies because they are forced to comply with an increasing number of reporting regulations. In particular, methods to design compliant BtG reporting systems are currently considered inadequate in IS research. This paper presents a way of supporting the management of legal reporting requirements by developing an approach for modeling and analyzing reporting regulations focused on the financial sector. The method is characterized in particular by the ability to represent and analyze legal reporting requirements. Using the examples of Risk Reports and the European Markets in Financial Instruments Directive (MiFID), the modeling and analysis capabilities of the method will be evaluated.

1. Business to Government Reporting

Since the financial crisis a couple of new regulations, such as Basel III and MiFID, have been introduced to prevent another bank collapse. These regulations have in common that a vast number of ratios have to be reported to government organizations like federal banks and supervisory authorities. Meeting all these reporting requirements is a challenging task for firms because regulations are manifold and often changing. Such regulations and their corresponding report complexities increase the need for methods to manage the vast number of regulations. But the costs of compliance and consideration of all necessary requirements are considered a major challenge of compliance management [1]. Thus, an approach to simplify the management of reporting regulations and to reduce compliance costs is fairly needed.

From a technical perspective, authorities like the Securities and Exchange Commission (SEC) or European supervisory authorities describe financial reporting obligations by using the data exchange standard XBRL (eXtensible Business Report Language) [5]. XBRL enables the transfer of reports in a homogeneous way and allows the interchange of data between software applications as well as automatic analysis of financial information [7]. However, XBRL does not aim to provide conceptual models of data warehouse systems and was not developed to support the engineering and planning of data warehouses.

From a conceptual perspective, the preparation of data for the compliance with BtG reporting requirements is challenging for data warehouse engineers and system designers. Not only do they have to construct suitable data warehouse structures to meet reporting requirements, but they also have to communicate with compliance and reporting experts, which often leads to communication problems based on differing background knowledge. Considering the BtG report complexity it is unavoidable to integrate reporting compliance experts in the data warehouse design process. But in most cases compliance and legal experts are not familiar with data warehouse structures. This necessarily leads to communication problems between data warehouse engineers and reporting compliance experts. A common ground [11] is missing in many cases.

To solve the clearly arising communication problems, conceptual models help build a common ground between compliance experts and system engineers [20, 24]. Current conceptual data warehouse modeling techniques, such as ME/RM [32], ADAPT [9], and DFM [16], enable representation of common data warehouse constructs like ratios, dimensions, hierarchies, and cubes. They have a more technical perspective and do not consider legal aspects and specific modeling challenges that arise when legal reporting requirements must be modeled. The goal of this paper is to fill this gap by presenting a modeling approach that is able to represent legal reporting requirements and thus build the foundation for analyzing reporting regulations.

The need for conceptual information models is theoretically derived and will be proposed in section 2.
Based on an argumentative analysis via legal examples, the requirements for necessary language constructs are developed and substantially described in section 3. The derived requirements form the basis for an adaptation of an existing modeling technique for conceptual modeling of reporting systems. The adapted modeling approach and its corresponding meta-modeling tool will be presented in section 4, followed by section 5 where we evaluate the resulting artifacts by applying the approach using two legally directed reports. Section 6 gives an outlook on an iterative ongoing evaluation and usage of the resulting artifacts.

2. Theoretical Foundation

Implementation and development processes often include expert involvement [3, 22, 27, 41] and formal methods for conceptual system design satisfaction [28, 36]. High quality conceptual work is a fundamental requirement for early detection and correction of errors in system planning [39]. Thus, it seems reasonable to consider legal reporting requirements during the conceptual modeling phase and before data warehouse changes are implemented. The consideration of reporting regulations and their incorporation into data warehouse structures is a challenging task. Compliance experts as well as system engineers have to work together, which causes communication problems when there is no common ground [11].

Our basic assumption is that the more regulation is present, the more formalized the design and analysis approaches for IS development have to be. The relationship between the degree of regulation and the importance of formal system design and analysis methods is based on complexity considerations. Conceptual models describe the physical and social world to understand and support communication between stakeholders [24]. The more complex the physical and social world is, the more communication is needed to understand it and prepare a common ground [11]. These findings are additionally supported by Norman’s Theory of Action [25]. On the one hand, model creators (i.e. system designers) aim to communicate their understanding by representing it within the model. On the other hand, model viewers (i.e. internal auditors or compliance experts) aim to understand the modeled real world object which is represented by the model [15, 25]. Norman [25] sees the modeling process as a way of bringing together the system design conceptions of model creator and model viewer.

A few studies examine the relevance of information representation in the area of auditing and accountant decision-making. For example, Amer, Lucy and Maris [2] found that “spatial or graphical representations prove to be the most efficient tool for auditors or programmers conducting a review of that documentation”. In particular, auditors who evaluate companies regarding their compliance with legal regulations, will be supported by use of structured and graphical representations of business processes and databases [2].

Boritz [8] proved that the structure of information presentation plays a significant role in auditor evaluation and planning. Dunn and Gerrard [12] compared different modeling notations regarding their effectiveness and efficiency to support the decision making of auditors. These studies indicate the influence of graphical representations on the decision making process in an auditing context. Thus, it can be expected that modeling techniques are an important factor for ensuring compliance, at least for audit processes. From a theoretical point of view the cognitive fit theory [35] underlines the importance of considering task and representation for optimal problem solving. If “there is a complete fit of representation, processes, and task type, each representation will lead to both quicker and more accurate problem solving” [35]. Tuttle and Kershaw [34] found out that graphs support holistic judgment strategies better than tables do (tables support analytic judgment strategies better). Because regulations must be considered in a more holistic way, these findings are essential for the representation of legal aspects in models and modeling techniques. It is hard to analyze a certain law regarding the presence of a particular word or a certain phrase. In order to analyze a law it is more feasible to consider the relationships between different paragraphs (e.g. the definition of terms or the linkage between different paragraphs).

Based on better communication of legal requirements and compliance verifications [10] as well as better handling of information system complexity through information models [33] an essential contribution to the development of compliant information systems is expected. When system designers have to decide whether a modification of an information system is legally compliant, this decision requires either detailed knowledge of the corresponding law or a separate review and approval by an internal audit or legal department. Both ways lead to additional effort that could be avoided if legal aspects had already been considered during the modeling phase of information systems and its corresponding processes.

Considering the above mentioned importance of conceptual information models, the following section
describes special requirements for a modeling technique that can be used for representing legal reporting requirements.

3. Identification of Requirements

The design of conceptual models for legally influenced reporting systems should enable the use of report elements which are able to represent regulations or legal requirements. In the following, we identify requirements for an appropriate modeling language that are derived from legal text examples and argumentations. The term regulation is used below for laws, rules, regulations, and recommendations, etc. which are relevant for financial report design. The regulations can be either external or internal. External regulations are prescribed for companies in the form of laws and regulations. Beyond external regulations, reporting is also restricted and directed internally by corporate rules. To describe the detailed structure of regulations, it is first necessary to set regulatory elements in relation to each other. Relevant types of regulatory element relationships are:

- **Consists of:** This relationship type depicts the structure of regulations. A law is divided, for example, into paragraphs which in turn consist of sentences, etc.

- **References:** This relationship type shows that individual regulations or regulatory elements are used for concretization and implementation of or based on other regulations or regulatory elements. Through this type of relationship, it is possible to map national laws that implement, for example, European directives. Mapping this relationship is relevant in order to assess the consequences of regulation changes early. Legal definitions often intentionally use vague terms, which require an interpretation. Therefore, internal regulations are often the concretization of laws, which can be represented by this relationship type as well. If a regulation requires certain conditions to be reported within a reasonable period of time, the internal rule may provide that a similar report is issued monthly. The current legal practice can call the concrete interpretation into question, for example, if it is found that a monthly interval of reporting under certain circumstances is not sufficient. To assess the consequences of current case law, documentation of the relationship between internal and external regulations is needed.

Under the heading “legal visualization” different approaches are discussed to increase the clarity level of regulations representation for non-lawyers (see [31]).

Therefore, for example, the logical links of regulations or the temporal-logical process of law interpretation are represented (see [26]). These approaches suggest that in addition to the above, other types of relationships, such as those for logic operations and time-appropriate logical sequences, should be supported.

Another promising approach to increase the clarity of regulations is the classification of regulation elements according to their deontic function (for deontic logic, see von Wright [38], Risto [30]). This approach explicates whether a regulatory element is an obligation, a prohibition, an exemption, or a permission. Regulatory elements that cannot be allocated to deontic functions can be used, for example, to define links to specific legal concepts (qualification) or to allocate competencies to executive institutions (power) (for this visualization approach, see Mahler [21]).

Regulatory elements are assigned to reports or their elements. The corresponding type of relationship is called validity and can be described in more detail through validity periods and geographical or sectoral/industry-specific regulations. The need for this model element can be explained, for example, using the German Solvency Act (SolvV). § 1 of the SolvV along with § 2, section 2 of the SolvV indicates the need to differentiate between credit institutions and financial services institutions in calculating the appropriate equity of a financial institute.

Conceptual model elements of reporting systems, which have to be designed in order to fulfill regulations, can be deduced from established approaches of conceptual modeling of data warehouse systems (see [14]). Table 1 uses the example of the German Solvency Act to suggest that respective report element types are relevant for the legal analysis of reporting systems. In addition to descriptions and examples, Table 1 also indicates whether existing modeling languages already support an aspect. Those modeling languages are listed below the respective aspect. If a modeling language provides a concrete designation for an aspect and it differs from the general designation in Table 1, it is also specified next to the name of the modeling language. Aside from the modeling of report items, which are defined by the reporting regulations, an appropriate approach should also enable legal analyses from two perspectives:

- **Analysis from a legal perspective (type 1):** A dynamic legislature, which can be found in particular in the financial sector, leads to a permanent change in reporting regulations. These changes constantly affect the corporate compliance management. At all
times it must be ensured that reports meet current legal regulations. Otherwise a legal violation has taken place. Analyzing model elements that are affected by regulatory changes is therefore an analytical requirement for tool-supported modeling.

- **Analysis from a report perspective (type 2):** From a reporting compliance perspective, report models must be able to be evaluated in the opposite direction as well. An analysis of all relevant report regulations should be made possible in order to ensure the compliance of a certain model if report elements need to be changed. Changes in ratio calculations, for example, must be legally authorized to prevent violation of regulations. Consequently, the ability to analyze legal regulations related to certain report model elements is a further analysis requirement.

To consider the requirements described above, an extended data warehouse and report modeling approach as well as its tool-support will be presented in the next section.

<table>
<thead>
<tr>
<th>Table 1: Relevant report element types for the legal analysis of reporting systems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aspect</strong></td>
</tr>
<tr>
<td><strong>Dimension / Hierarchy</strong></td>
</tr>
<tr>
<td><strong>Instance Object</strong></td>
</tr>
<tr>
<td><strong>Ratio</strong></td>
</tr>
<tr>
<td><strong>Ratio System</strong></td>
</tr>
<tr>
<td><strong>Report</strong></td>
</tr>
<tr>
<td><strong>Report Layout</strong></td>
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<tr>
<td><strong>Report Attribute</strong></td>
</tr>
<tr>
<td><strong>Reference Object Attribute</strong></td>
</tr>
</tbody>
</table>

### 4. Development of a Tool-Supported Modeling Approach

The approach for modeling and analyzing of reporting regulations was implemented using the meta-modeling tool H2-Toolset and extends the modeling language **H2 for Reporting** (H2fR) (see [18]). The reasons for this decision were the following:

- The (hierarchical) modeling language H2fR supports all of the usual elements of modeling reports. H2-Toolset represents the software-based tool support for H2fR. A hierarchical sub- and superorder of model elements is easy and understandable which has been shown more than once by practical applications of H2-Toolset [4, 37, 40].

- As a meta-modeling tool, H2-Toolset supports the definition of new and the adaptation of existing...
modeling languages. H2fR, which is already implemented in H2-Toolset, can thus be extended via tool assistance in order to meet previously identified requirements.

- The plug-in architecture of H2-Toolset enables a flexible extension of capabilities of H2-Toolset. Import and export interfaces, analysis tools, transformation and processing mechanisms provide a typical range of existing H2-Toolset plug-ins. The analysis of reporting regulations can be realized in an analysis plug-in, integrated into H2-Toolset. It operates on models designed with an extended version of H2fR.

The opportunity to develop individual capabilities, new modeling languages and to develop hierarchical models encourages the use of H2-Toolset in different domains. Thus, H2-Toolset is not only used for specification and analysis of reporting systems and the information basis of management information systems. It is also used, for example, as a database for product configuration in hybrid products and services [4], definition of supply chain event management systems [40], and illustration of composite groups of enterprise content [37].

The general structure of H2fR is depicted in Figure 1. In Figure 2, the legal extensions of H2fR are considered. The gray shaded model elements illustrated in both figures represent identical language components. In the following, the model elements in Figure 1 are briefly explained (cf. [18]). Please note that italic font style is used when referring to one of these model elements for the first time.

Reference objects can be measures, processes, institutions, operational components, services, etc., which can be subject to managerial analysis [29]. More concrete examples of reference objects are products, financial instruments, customers, customer groups, date/time combinations, departments, branch offices, and employees. Reference objects can be hierarchically structured, forming so-called dimensions. While instance objects represent concrete reference objects, selection objects may take on two roles: Selection objects (1) represent the hierarchy levels of dimensional hierarchies the instance objects belong to or they (2) can be used as a “wildcard” for instance objects. Often, instance objects are not known a-priori and thus cannot be modeled (e.g., the concrete customers). Dimension scopes limit dimensions to an excerpt that is necessary for a certain analysis requirement. For example, § 2 of the German Liquidity Act (LiqV) defines four different maturity bands that contain different time lines to classify liquid equity. Instead of taking the whole time dimension, a dimension scope that represents the corresponding maturity band must be applied to calculate the required facts. In the following, dimensions, dimension scopes, and reference objects are referred to as dimension elements (cf. “Dimension (-element)” in Figure 1).

While reference objects are the actual subject of managerial analysis, ratios describe qualitative or quantitative properties of the reference objects under investigation [19, 29]. Qualitative and quantitative analyses are always conducted with both ratios and reference objects. The concrete values of a ratio with respect to certain reference objects are called “facts”. For example, the turnover of branch office “BO1000” for derivatives in August 2011 was 500,000 €. In this example, “turnover” is the ratio, “BO1000”, “derivatives”, and “August 2011” are reference objects, and “500,000 €” is the fact (regardless of whether this is a realistic value). Ratio systems define the dependencies of ratios in a mathematical or a business logic sense. For example, a ratio system can express the relationship between turnover, costs, and profit: The profit is calculated by subtracting the costs from the turnover. Fact calculations represent facts (on a conceptual level) that are calculated depending on one or more ratios with regard to certain dimension scopes. In the following, ratios, ratio systems, and fact calculations are referred to as ratio elements (cf. “Ratio (-element)” in Figure 1).

The space of managerial analysis can be described using the concept of a multidimensional cube. Because of the OLAP functionality (cf. [9]) that is provided by multidimensional data cubes, such a cube is also known as a navigation space [17]. The cube is spanned by several dimensions and contains the values (facts) for certain ratios. The concrete facts are not part of the conceptual description of a reporting system as they are not known a-priori and thus cannot be modeled. In a conceptual specification, a cube is related to ratios and dimensions describing its structure (not its contents/facts). A report can be seen as a two-dimensional projection of a multidimensional cube. The two-dimensional structure of a report is described by layout elements such as rows and columns. Rows and columns can be hierarchically structured to create complex layouts, such as nested tables or multipart reports. The contents of the rows and columns are defined by relating ratio elements and/or dimension elements to them (cf. “Dimension (-element) occurrence” and “Ratio (-element) occurrence” in Figure 1). Filters can be assigned to reports (or to single layout elements of a report) to allow restriction of the cube’s input data to certain dimension scopes or reference objects.
In the following, the model elements of the legal extension of H2fR are briefly explained (cf. Figure 2). As for the description of general constructs, italic font style is used when referring to one of the model elements for the first time.

A regulation element can be, for example, a complete law or directive or just a part of it, such as a paragraph or a single sentence. For example, MiFID (2004/39/EC) covers 73 articles which may consist of several paragraphs containing one or more sentences.

External regulations, such as laws, directives, etc., are imposed by the legislature. Internal regulations are company-specific rules that are either self-imposed or derived from external (or other internal) regulations. In the latter case, such internal regulations implement the referenced regulations as a concretization or individual interpretation of legal freedom.

To increase the clarity level of regulation elements, a classification based on their deontic function is proposed. This approach explicates whether a regulation element is an obligation, an exemption, a prohibition, or a permission. Regulation elements that cannot be allocated to deontic functions may be used, for example, for defining specific legal concepts in detail (qualification) or allocating competencies to executive institutions (power). Regulation elements that cannot be clearly assigned to any deontic function or to qualification or power are of the non-deontic type “other”.

Regulation elements can be related to report elements, such as dimensions, reference objects, ratios, reports, etc., aiming to establish a relationship between reports (or report elements) and regulations. Such a relationship is called “validity”. There are two options to use validities, either to explicate the regulatory basis for a certain model element (e.g., a ratio must be calculated regarding a certain paragraph in law) or to indicate that a whole report is based on a certain regulation. Validities can be further refined by assigning validity attributes to them. In this way, for example, temporal validities can be specified. § 13 of the German Liquidity Act (LiqV) states that the German Liquidity Act comes into effect on January 1st 2007. Sections 154 and 164 of Basel III are attributed by section 166, no. 2: “[...] disclosure of the leverage ratio and its components will start January 1st 2015.”

Reference object attributes can be assigned to existing reference objects aiming to represent the presence or the composition of certain data that is directed by law. This includes, for example, the identification options of customers (e.g., customer name or customer number). Report attributes further describe the properties of a certain report. Examples are the report recipient, the periodicity (or frequency, period, or triggering event), and the report type. Other attributes like the medium (or format) are also conceivable. Aside from the extension of the conceptual modeling technique H2fR, the identified requirements have also shown the need for certain legal analyses. For this purpose, we developed a plug-in that enables both analysis types mentioned in section

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**Figure 1: General meta-model of the modeling language H2 for Reporting**

Paragraphs and sentences may also contain lists including multiple numbers. Thus, there are regulation elements of different granularity that are hierarchically structured forming a complete regulation. However, regulation elements can also relate each other without having the one being part of the other. For example, some sections of the German MiFID implementation, WpDVerOV, reference certain articles of the European directive. Thus, for regulation element relations, it is distinguished between “consists of” and “references”.

![Diagram of the model elements of H2fR for Reporting](image-url)
3. The next section demonstrates the applicability of the language as well as the analysis plug-in using the examples of market risk and MiFID reports.

![Figure 2. Meta-model of the extended modeling language H2 for Reporting](image)

5. Application

5.1 Market Risk Report

The following application of the presented modeling technique is based on an excerpt taken from § 304 of the German Solvency Act (SolvV) published on December 14, 2006 that states: “The difference between the aggregated relevant amounts of the net long and short equity positions shall be included, with an 8 percent weight, separately for each national equity market, as the partial capital charge for general risk. The institution’s own equities which it holds in its portfolio shall not be included.”

An associated report template helps to structure and display the relevant information regarding the “general risk of the net equity position” mentioned in the legal text. The report template shown on the right side of Figure 3 is an extract of the original report template provided by the German Federal Bank (Bundesbank).

The corresponding H2fR model, depicted in the left part of Figure 3, contains two dimensions: “national equity market” to combine all reference objects referring to a country and “time” since this particular report refers to the year 2010. Regarding the national equity market, there is one selection object called “country” and six instance objects representing the countries explicitly mentioned in this report (Germany, France, Great Britain, etc.).

![Figure 3. Market risk H2fR model and report excerpt](image)

In terms of the time dimension, which is a mandatory dimension needed for most reports, it may contain year, month, and day as hierarchy levels modeled as selection objects. A dimension scope limits the time to the year 2010 and excludes the hierarchy levels month and day which are not needed in this scenario. The ratios correspond to the columns of this report. Assets and liabilities are basic ratios while net equity is a calculated ratio defined as “assets minus liabilities”. Thereafter, as the legal text states, net equity is multiplied by 8 percent to calculate the general risk for each equity market, which is a calculated ratio, and eventually aggregated.
over all equity markets (not explicitly modeled, cf. “Sum (General Risk)” in Figure 3).

5.2 Financial Portfolio Management Report

A second application case contains reporting obligations directed from MiFID and its German interpretation. The directive is mainly relevant for investment service companies in the European Union and is therefore one of the most important regulations in the European financial sector. In our case we focus on an excerpt of the portfolio management report that is required according to directive 2004/39/EC of the European parliament. The report excerpt is depicted in Table 2. Each financial institution that offers financial portfolio management services is required to create a report that, among others, contains the following information:

- Customer account
- Type of order
- Order execution time
- Single order execution, financial product, category and group
- Market value, quantity, purchase price, commission, fee, and current account balance

Table 2. Portfolio management report excerpt

<table>
<thead>
<tr>
<th>Account</th>
<th>Market Price</th>
<th>Quantity</th>
<th>Price</th>
<th>Commission</th>
<th>Fee</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21st week (...)</td>
<td>LSE</td>
<td>Equities</td>
<td>Put</td>
<td>Call</td>
<td>Future</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Debt instruments</td>
<td>Put</td>
<td>Call</td>
<td>Future</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22nd week ...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sell</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21st week ...</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

To conceptually represent the required report information we applied H2fR to prepare a conceptual data warehouse model that can be found in Figure 4. Aside from the data cube (whose structure is not visible due to limited space) the dimensions “time” and “execution” (order execution) as well as the selection objects “account” and “type of order” act as reference objects in that report.

Figure 4. Portfolio management H2fR model

They are implemented as row elements, whereas the ratios (market value, quantity, price, commission, fee, and balance) are represented in the report columns. Each dimension and selection object contains a relation to its regulative basis. We are showing exemplarily the regulation for the calculation of the price ratio. According to § 9 of the German MiFID implementation, WpDVerOV, the report addresses the customer (account holder) and must be generated and delivered at least every six months, as represented by report recipient and periodicity attributes.

To analyze the model, the plug-in supports the specific selection of model elements, such as dimensions and ratios which might particularly support the compliance management in the case of changing laws and regulations. To show how legal report analyses can be conducted, Figure 5 demonstrates both analysis options (cf. section 3). The left side of Figure 5 shows report elements that are affected by regulation changes of § 8, paragraph 2 of the WpDVerOV (type 1). The right side of Figure 5 shows the analysis of the corresponding regulative basis of the hierarchy level “customer” (type 2). The analysis extracts all legal regulations associated with the hierarchy level “customer” within the scope of MiFID. By displaying all regulations and regulatory elements corresponding to customers, a target-
oriented legal analysis of proposed report changes is made possible which would be time-consuming using conventional means.

Figure 5. Model analysis

6. Summary and Outlook

The paper describes an approach to integrating legal principles in reporting models and facilitating analyses of these relations. It was shown that the data basis, which is described by the language extension of H2fR, allows different analyses of legal regulations. Based on the comparisons in Böhnlein [6], Gabriel and Gluchowski [14] and Table 1, current modeling techniques show a performance deficit regarding the ability to present and analyze legal requirements. Closing this gap is the aim of the presented approach.

The approach requires an extensive evaluation consisting of several steps. In addition to the implementation, the exemplary application of the modeling technique and initial successfully conducted legal analyses, there are plans to extend the application and to evaluate it in a diverse practical environment. Therefore, cooperation with one of the world’s leading audit firms has been arranged. Furthermore, the relevance has been confirmed in initial discussions with compliance experts in the financial sector, in which the presented approach received much interest. In this context, it is important to evaluate the contribution of in-depth qualitative and quantitative studies to compliance management. From a tool-side perspective, the mapping between XBRL and H2fR must be implemented to import and export XBRL report schemes.

When applying the idea of reference models [13, 23] to BtG reporting, it is meaningful to prepare reference models that first represent legal reporting requirements and secondly can be configured to a company-specific environment. The preparation of such reference models by authorities like the SEC or the European Central Bank would be a milestone in handling the complexity of legal reporting obligations. The presented modeling approach is a first basic step toward being able to represent legal reporting obligations in a suitable way and to design reference models.

Even if this new way of thinking might lead to strong acceptance barriers among lawyers, the availability of legally approved conceptual data models would have positive economic effects. Therefore, the presented work is a necessary prerequisite.

7. References


Teasley, eds., Perspectives on Socially Shared Cognition, Amer Psychological Assn, 1996.


