

The Added Value of Collaborative Modeling for Legal Business Rule Management

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Abstract. In this paper we discuss background considerations, domain properties, and some design principles for collaborative modeling environments combining the Business Rule Management approach and the Collaborative Modeling approach. The context focused on is that of translating law texts to operational processes and systems for implementing those laws in the public sector. The process of operationalizing law is very difficult to tackle: a diversity of stakeholders have to be involved to reach consensus on semantics, goals and business service design. We consider collaboration techniques crucial in order to create the required broad basis of acceptance regarding operational policies and their formulation. Collaboration techniques also enhance the efficiency and transparency of the process. We discuss the new role of collaboration in relation to the governance processes of the organizations. We illustrate a design case by describing an environment we are developing. We reflect on some lessons learned, concluding that adopting collaborative modeling techniques alone is not enough. Explorations show that additionally, rules and mechanisms are needed to structure and facilitate the group decision making process.

Introduction

This paper was written in context of an ongoing development project aiming to create a collaborative modeling environment developed to support Dutch governmental organizations in implementing legislation into their operational processes. Though we do sketch the current prototype environment and some design principles, the paper mostly concerns generic considerations about collaborative aspects in this application domain and its consequences for “law execution support systems”.

In the process of business rule creation and management, a variety of stakeholders (legal experts, business management, business architects, IT-experts) work together in order to translate legislation into usable specifications for operational business processes, including specifications for business rule driven IT-systems. In the Netherlands, as well as in various other countries with a thoroughly digitized governmental and public sector, such processes can be observed to exist in many domains (e.g. tax, customs, subsidies, permits, defense) and across a number of governmental organizations.

This process is commonly recognized as being very complex. Legislation is not directly usable in operational situations (typically, law execution by public service organizations). Terms and phrases used in legislation documents often contain pragmatic mismatches and contradictions because of the different contexts in which they are used.

Also, legislation tends to describe *WHAT* a policy should be, but not *HOW* it should be implemented by the variety of organizations that have to deal with it. Frequently the legislator deliberately leaves definitions and criteria vague, in order to let exact and definitive criteria arise in practice. In short: substantial additional policy making is needed to design business services and operational business rules that can be handled in everyday work processes.

The effects of ignoring collaboration

Current methods for ‘translating’ legislation into operational rules (though perhaps ‘developing’ would be a more accurate word here) typically have their origin in Business Rule Management practices. This discipline traditionally approaches the translation quite rationally, for example (Wyner, Engers, & Bahreini, 2010). The normal approach is to rewrite sources (legislation documents) directly into some sort of formal logic, in a format that can be logically validated and is suitable for further translation into executable rules that can be handled by business rule engines and other rule-based systems.

However, the actual translation process in practice can hardly be classified as being “rational” in the discrete and deterministic sense. Interpreting legislation and

the design of business services, thus implementing legislation, involves input of a variety of stakeholders. All stakeholders act according to their own perspectives and goals and use their own ‘domain specific language’. Traditional methods tend to ignore these aspects. They regard them as being the concern and responsibility of the “super IT-analyst”, who has to consult all stakeholders involved and unify their views and formulations. Such super analysts are very hard to find in real life, which causes a scalability issue within the organization. While the speed of implementation power increases dramatically due to the introduction of modern business process management platforms, analysis and design become the new bottlenecks (Hoppenbrouwers, Schotten, & Lucas, 2010).

Ignoring collaboration factors during the formulation of operational policies also introduces another serious issue. The business policies that will be implemented often only include the input of a limited set of stakeholders. In many cases, only a legal expert is consulted and legislation is rationally converted into some kind of logic. The resulting working instructions and systems often do not meet the views and practices of the knowledge workers that have to deal with real life cases. As a result, they feel unsafe because decisions are made that cannot be motivated or that do not take into account the situational context of cases in real life. In short, lack of a common base of understanding has negative effects like the leaving of valuable employees (not willing to adopt the policy made), customer unfriendly behavior (“the system is always right”; “computer says no”) or fraud and sabotage (manipulating real life data/facts in order to reach a desired outcome, or simply ignoring systems and policy), causing erroneous and inconsistent behavior of the organization’s services.

In order to fulfill the need for collaboration in law-based business rule creation and management, a modeling environment is being developed combining traditional business rule management techniques with those used in collaboration environments

Collaboration to support Shared Decision Making

Commonly known collaboration techniques (chat, shared annotation of documents, discussions, forum, mentioning, case management) are used to optimize the process of working together and making shared decisions. Collaborative techniques as in, for example, (de Vreede & Briggs, 2005; Kolfshoten, Briggs, de Vreede, Jacobs, & Appelman, 2006) turn out to be a crucial factor to tackle the issues in collaborative rule management experienced today

With the help of collaborative modeling techniques, a large group of people can be involved in shared decision making. By facilitating an online workspace, people will no longer be dependent on each other’s agendas. Asynchronous work reduces the need to physically meet during design and group decision making. A substantial larger number of people directly or indirectly can be involved.

When working in an environment deploying collaboration techniques, questions, answers and arguments in discussion are systematically logged so they can be shared and responded to at a later moment. This also allows for detection (not necessarily automatically!) whether people are arguing from the same perspective or not, which can help prevent misunderstandings and mistakes rooted in deviant interpretation.

Sharing knowledge is no longer limited to a point to point interchange between individuals. When reusing the model elements in multiple products and services, decisions and semantics will automatically be reused too. The possibility of reusing the outcome of the ‘translation process’, *including the underlying group conversation*, is essential for implementing consistent and correct behavior of organizational services. For the government, this means consistent and reliable behavior towards citizens and companies.

Computer supported collaboration support: a new enabler for compliance

In our modeling environment and domain, in addition to the common application of collaboration, computer supported collaboration did get another very important, and unexpected new role. It has been integrated with the governance processes of the organization.

The business rules (operational policies) created in the process are implemented in a business rule system. This system is able to automatically reason over these rules so it can automatically decide whether e.g. citizens or companies are entitled to receive subsidy or are allowed to receive a residential permit. Even the amount of tax citizens have to pay are calculated automatically. For the organization it is crucial to be able to explain why a decision is made. Although a direct link to relevant legislation sources at first hand seems sufficient, exact explanation can only be based on the design decisions made when formulating the operational policy. So when the system generates explanation it actively uses the arguments behind the discussions when formulating the business rules, in order to really provide 100% transparency in decision making. Without computer supported work this could never be realizable because these arguments never were systematically logged.

Lawyers use these outcome of collaboration processes results when judging official complaints being filed. They even use them when preparing the lawsuits.

A prototype environment for collaborative rule management

The prototype environment in development enables various stakeholders in developing multiple interconnected models in parallel: a model concerning the requirements formulated by the legislator in the law documents, a model with a design of the business services that will be implemented by the governmental organization in order to “bring” the law’s business rules to relevant citizens and/or companies, and a model containing the design of the operational business process, and a model containing the implementation of these business processes within the organization. The different stakeholders involved in creating these models can work together in parallel and use each other’s input. Collaboration techniques help them to discuss about the design and to reach consensus about contradicting opinions and concerns. Because each stakeholder have its own “language and abilities to handle abstract models”, the environment emphatically respects the variety of stakeholders. Therefore, stakeholder specific ‘views’ or ‘design studios’ are developed.

The studio for legal experts

One of the views will support the legal expert. In this view the legal expert has the ability to track new or changing legislation. The studio allows the legal expert to break down the legislative text in separate contexts. Each context can be worked out separately, can be re-used in multiple business services and can be related to other

contexts. The studio also enables the detailed, semi-formal description of the semantics (the definition) of the terms used in the texts, and of the annotation fragments

that contain relevant specifications, such as actors, calculation-rules, decision-

Welkom 1 Analyse wetgevingskader 2 Analyse intern beleid 3 Ontwerp diensten en producten 4 Ontwerp Gestandaardiseerde activiteiten 5 Toewijzen en implementeren diensten

Wet inkomstenbelasting 2001

3 Memorie van toelichting

11 De inspecteur beslist op het verzoek bij voor bezwaar vatbare beschikking.

Artikel 3.155. Te conserveren inkomsten buiten beschouwing

Voor de toepassing van deze afdeling worden de geheven en de herenkende belasting bepaald zonder rekening te houden met te conserveren inkomsten en de daarvoor verschuldigde belasting.

Afdeling 3.15. Zekerheid omtrent de aard van de voordelen uit een arbeidrelatie

Artikel 3.156. Vragen van een beschikking

1. De belastingplichtige die zekerheid wenst omtrent de vraag of de voordelen die hij in een kalenderjaar geniet of zal gaan genieten uit een arbeidrelatie of uit arbeidrelaties waarin sprake is van hetzelfde soort van werkzaamheden die onder overeenkomstige condities worden verricht, worden aangemerkt als winst uit een onderneming, als loon of als resultaat uit overige werkzaamheden, kan een verzoek indienen bij de inspecteur. De inspecteur beslist op het verzoek bij voor bezwaar vatbare beschikking.

2. Zodra de feitelijke omstandigheden afwijken van de door de belastingplichtige gepresenteerde omstandigheden op basis waarvan de beschikking is verleend, meldt de belastingplichtige dit aan de inspecteur.

3. De inspecteur kan de beschikking herzien, indien de melding van de belastingplichtige als bedoeld in het tweede lid daartoe aanleiding geeft of hem uit anderen hoofde bekend is dat de feitelijke omstandigheden daartoe aanleiding geven. Herziening vindt plaats bij voor bezwaar vatbare beschikking.

4. De beschikking gelooft voor een termijn van ten hoogste één kalenderjaar.

5. Ingeval de aanvraag betrekking heeft op werkzaamheden die zijn aangevangen of zullen aanvangen na het begin van het kalenderjaar waarop de aanvraag betrekking heeft, gaat de in het vierde lid bedoelde termijn in op de dag van de aanvang van de werkzaamheden.

kan een verzoek indienen bij de inspecteur.

Recht indienen verzoek bezwaar Voeg toe

Recht Actie Belastingplichtige als ondernemer Aanvraker

Context

Wet inkomstenbelasting 2001

Definities

Modaliteiten

Rchten

Plichten

Bevoegdheden

Procedures

Verboden

Structuren

Termen

rules, legal rights, obligations, procedures and so on. It will also enable visual modeling of the hidden structures that specify how decisions or calculations should be made.

During creation of a law, the proposed law text may change many times. The system will act on automatically sent change alerts. It will intelligently compare the text of newer versions, will visualize changes made and will transfer the unchanged parts of the model from the old version to the new version. Besides comparison, active support is available for determining the impact of changes on the design specification already available, and on operational processes and systems.

The business service design studio for business architects

Besides the view for the legal expert, a view is created for the business architect responsible for determining and designing the organization's business services. This view uses its own sources (documents), but will also use model elements being created by the other stakeholders, like the legal expert. However, these model elements will be presented in the domain specific language of the business architect. For example, the model element "*legal right of a citizen*" will be represented as a "*deontic modality*" to the legal expert whereas it will be represented as a potential "*business event*" toward the business architect, and so on. By translating the model elements in line with one 'mental model' to those in line with that of another type of stakeholder, stakeholders with different backgrounds and languages still can work on one interlinked and consistent, hidden overall model.

In the future, additional views will be added for the other stakeholder types involved, such as IT-analysts, information architects, managers of data administrations, and so on.

Enable collaborative shared decision making

A set of collaborative techniques are combined in an online workspace that is available in and across all "stakeholder views". It will allow modelers as well as more indirectly involved stakeholders to engage in various forms of digitally mediated, dedicated conversation: discuss, react on each other's arguments and opinions, and so on.

The need for games

In our explorative designs and evaluations it became clear that exclusively adopting collaborative modeling techniques to share ideas and information is not sufficient. When designing the business service and its products another important stakeholder comes in sight: the customer, being a citizen or an professional

organization that will be confronted with the services and products based on legislation. Important decisions have to be made such as: “who is our target group exactly?”, “what is the profile of our customer?”, “which criteria should be met in order to entitle individuals within this target area to the products made available by law, like subsidies?”, “which questions should we ask? We cannot always use the terms used in the legislation text, because people might not be able to answer them due to the high level of abstraction.

In order to reach an optimal design, serious games, like for instance a “mystery game” can play an important role. In the mystery game a set of “mysterious” stakeholders (panel members) are trying to ask with a minimal set of questions enough information of the mystery customer in order to find out whether he/she is entitled for getting e.g. a subsidy. Of course each stakeholder use the law and internal policies to formulate the questions. The resulting profile and dialog leads to customer friendly design decisions.

Discussion and future directions.

In our explorative designs and evaluations, the collaboration techniques supporting and structuring such conversation turned out to be a crucial success factor in tackling most issues experienced in the field today. As discussed, they help to gather a solid basis of understanding between all stakeholders. They help to improve efficiency in decision making. They offer the possibility to share knowledge between individuals and they help to implement transparent business processes. Although these positive aspects will not come as a surprise for the community of computer supported collaborative work, they are completely new terrain for the business rule management community however.

The new role of collaboration in governance will have impact on the organization and tools developed to support the collaborative process. First of all a direct reference should be created between discussions and the business rules that are being produced. Also it is necessary to select which discussions may be used for the governance process. E.g. is it desirable to include the names of the stakeholders involved in the formulation of the business rule or should this be anonymous or accessible for special lawyers only? This will be an important issue for further study.

Important additional success factors may be found in further refinement of the basic techniques by means of additional visualization, games and facilitation support.

There is no effective discussion without a clear understanding of the problem. Visualization of developed policy is crucial to evaluate the effectiveness and impact of the business rules formulated.

As discussed, serious games are considered to be an additional means of enhancing the outcome for a problem. Game elements combined with effective

visualization can help stakeholders discover the best operational business policy together. Rules of play can also help guide problems collaborative solving processes and conceptualization. In addition, game elements can help motivate participants and make goals and progress more visible and manageable.

Besides diverging techniques like sharing ideas and opinions there is a strong need for converging techniques in order to make actual decisions one can base further action on. In short, there is need for facilitation. Explorative investigations in collaborative modeling setups, in the case project but also, for example (Hoppenbrouwers & Rouwette, 2012), showed that rules are needed to structure and facilitate the group decision making process. Many of these rules deal with social factors like handling different levels of experience and power positions between stakeholders involved. Facilitation is a skill and this capability is often scarcely available within organizations. Because of the continuous process of translating large scale legislation into specifications, an important next step is to investigate whether it is feasible to add computer aided facilitation techniques to the platform, in order to meet the crucial needed scalability.

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