e³RoME: A value-based Approach for Method Bundling

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ABSTRACT

Situational Method Engineering concerns itself with the formal, structured construction of project-specific methods from a prespecified set of method fragments.

However, before embarking on expensive efforts to actually construct project-specific methods, such as defining a formal method transformation or integration, it makes sense to first perform a value-based assessment. This means that (1) one first assesses what methods fit together, given a certain modelling need, and (2) to make a cost-benefit analysis for the given set of modelling techniques, in terms of weighting the expected benefits against the required modelling effort.

We introduce a value-based approach towards assembling a combination of method fragments, called e^3-Return on Modelling Effort, or *e^{3}RoME* in short. In particular, we discuss the reuse a value-based matchmaking mechanism developed for earlier service bundling work to reason about creating interesting combinations (or: bundles) of methods. Note that we focus our contribution mainly on value-based matchmaking: as such, method costs are less of a consideration for this paper.

We replay an experiment on method integration and transformation to illustrate our approach.

Categories and Subject Descriptors

H.4 [**Information Systems Applications**]: Miscellaneous

Keywords

Situational Method Engineering, Conceptual Modelling, Value Modelling, Method Bundling

1. INTRODUCTION

Situational Method Engineering concerns itself with providing structured, formal support for the development of situation-specific methods out of smaller method pieces [3, 9]. However, as pointed out in [9] method construction also implies investing effort, for example in the sense of defining a formal integration or transformation between method pieces, whereby one has to cope with syntactic/semantic differences between methods, and project specific issues, such as adapting a candidate set of methods to a specific (project) context, matching to stakeholder skills, and more.

As such, before embarking on expensive efforts to construct a method, it makes sense to first make a first-pass, value-based, assessment. We contend that such a value-based assessment has two facets: (1) a cost-benefit analysis. Given a candidate set of methods, does the (estimated) effort of integrating them outweigh the (envisioned) benefits? But also (2) to uncover stakeholder-value. So: before making a formal cost-benefit analysis for a candidate set of methods, what is a suitable combination of method pieces for certain stakeholder concerns?

In this paper, we introduce a method for value-based Situational Method Engineering, called *e^{3}RoME*. *e^{3}RoME* is a part of the e^3-family name, which refers to a family of value modelling methods. A key idea for this paper is that to develop the *e^{3}RoME* method, short for e^3-Return on Modelling Effort, we can largely build on a value-based matchmaking mechanism developed in earlier work on semi-automated needs-driven service bundling, called *e^{3}service* [12, 5, 2].

As we discuss in more detail in Sect. 2.1, *e^{3}service* provides a value-based mechanism that, when adapted for method engineering, allows one to translate needs of modelling stakeholders into suitable combinations of method fragments. Analogous to service bundling, we thus create a formal approach towards what we coin "method bundling": a first-pass, value-based, evaluation of a candidate set of method fragments for Situational Method Engineering.

As we first want to analyze to what extent the value-based matchmaking mechanism of *e^{3}service* makes sense in Situational Method Engineering, we focus on our second facet of a value-based assessment: before making a formal cost-benefit analysis, what is a suitable combination of methods for certain stakeholder concerns? We focus *e^{3}RoME* for now combining on conceptual modelling techniques.

Note that, in Situational Method Engineering, some early work exists on goal-oriented selection of method fragments [4, 1, 13]. But this work is somewhat preliminary, as also pointed out by [9, p.465], who in a recent state-of-the-art on Situational Method Engineering argue that to move from stakeholder requirements to an optimal set of method fragments in a semi-automated way is an important research challenge.

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2. VALUE-BASED MATCHMAKING

We now first explain the main ideas behind method bundling (in Sects 2.1 and 2.2). Subsequently, we address two assumptions for using a service bundling method in the area of Situational Method Engineering (in Sect. 2.3).

2.1 Method bundling

Method bundling entails that we produce interesting combinations (or: bundles) of methods, given needs of modelling stakeholders, and valuable outcomes/inputs of methods. A key idea for this paper is that, for *method* bundling, we reuse the formal needs-driven matchmaking mechanism developed in earlier work for needs-driven, semi-automated, *service bundling*.

This service bundling method, called e^3*service* [12, 5, 2], specifies, in a 'smart' question answer game, a customer need (for example: "communicate with a family member abroad") into suitable combinations (or: bundles) of services (for example: the service bundle {VoiP(Skype), IP-access} can satisfy the need "communicating with a family member abroad"). e^3*service* relies on multi-disciplinary theory development: it uses theories from marketing for needs analysis and capturing commercial services, but formalize them with formal ontologies from computer science so as to enable computer-supported analyses. In so doing, e^3*service* provides on the one hand ideas from marketing to discuss with domain experts commercial services and service needs. However, on the other hand, it provides computational support, by means of software tools, for (semi-)automated bundling reasoning.

For method bundling, it would be interesting to look at reusing (1) the value-based mechanism for translating customer needs into service bundles, (2) a decision making method that balances the costs and benefits of such a bundle, and (3) the formal, software, tool support that exists for both.

2.2 Key ideas

Due to space restrictions, this paper discusses only the key ideas behind method bundling.

For illustration purposes, we use the method bundle depicted in Fig. 1. This method bundle captures an experiment for integrating three conceptual modelling techniques, detailed in [6]: e^3*value* [8], a technique for modelling an enterprise from a value perspective, DEMO transaction patterns [7], patterns that detail, from a social perspective, (economic) transactions into business processes, and ArchiMate [10], an Open Group standard for modelling Enterprise Architectures. In particular, the method bundle formalizes the rationales in terms of value behind integration and transformation of these techniques. For the depicted bundle, observe four key features:

• *Methods are conceptualized in terms of the value they provide.* For example: the method fragment 'ArchiMate modelling' can provide 'Business process perspective on enterprise' and 'IT application perspective on enterprise'.

• *The value of a method bundle can be more than the sum of its parts.* In Fig. 1, bundling is indicated by the 'value interface' concept. For example: the model bundle provides 'link business-IT', which would not have been possible with separate models for IT applications respectively business processes.

• *The stakeholder value of methods is explored in a stakeholder perspective catalog, separate from the collection of individual methods (Note: we cannot show the stakeholder perspective catalog due to space restrictions.).* For example: 'Business process perspective on enterprise', 'IT application perspective on enterprise' and 'Link business-IT', from the method 'ArchiMate modelling', contribute to the more abstract valuable outcome 'Have holistic perspective on enterprise'. Such abstraction, called laddering in customer psychology (see, for example, [15]), is a common way of linking abstract stakeholder concerns to attributes of a specific object. In our case, the object is a method.

• *In the stakeholder perspective catalog, valuable outcome A can add value to valuable outcome B, including a rationale for value addition. This is important for creating method bundles.* For example: 'Value perspective on enterprise' from the method 'e^3*value* modelling' relates to 'Have holistic perspective on enterprise' with the rationale 'Provides economic rationale for business operationalization'. Subsequently if, because of said rationale, a method engineer is interested to include a value perspective in the holistic perspective, 'e^3*value* modelling' is suggested to be used with 'ArchiMate modelling'.

2.3 Assumptions

Given that we use methods instead of services as input for our method, we should be careful with at least the following assumptions:

• *Financial feasibility* - e^3*service* uses the criterium of financial feasibility for modelling a service, meaning that it should be economically feasible for a provider to provision the service in its own right. While e^3*RoME* has a similar question, namely: 'does this particular combination of modelling techniques pay of?' it is the question of how the idea of Return on Modelling Effort compares to commercial feasibility as such. However, given the focus of this paper on finding interesting bundles of methods, with less of a consideration for modelling costs, we will for now not address this assumption.

Also, independently of this assumption, the basic idea still holds: to conceptualize methods in terms of the value they provide, and to use our existing framework and tool support to reason about interesting method combinations.

• *Business-to-Business versus Business-to-Customer* - e^3*service* was developed for end-customers, whereas e^3*RoME* is used in a business-to-business context. This assumption can affect our basic matchmaking mechanism, yet we can reasonably maintain it since needs analysis in a business-to-business context has strong parallels with needs analysis in a business-to-customer context. We observe the application of the basic needs concepts from e^3*service* in a business-to-business context as well: in logistics, where [11] uses means-ends chaining to understand business needs of channel partners, and in the area of enterprise architecture, where [15] assess how enterprise architecture contributes to achieving the goals of individual (business) stakeholders. Furthermore, the notion of means-ends is central to the Business Motivation Model [14], an OMG standard aimed at modelling both business and end-customer motivations. In particular, in the above business-to-business references means-ends chains are applied to link valuable attributes to more abstract stakeholder motivations. This is done also in e^3*service*.

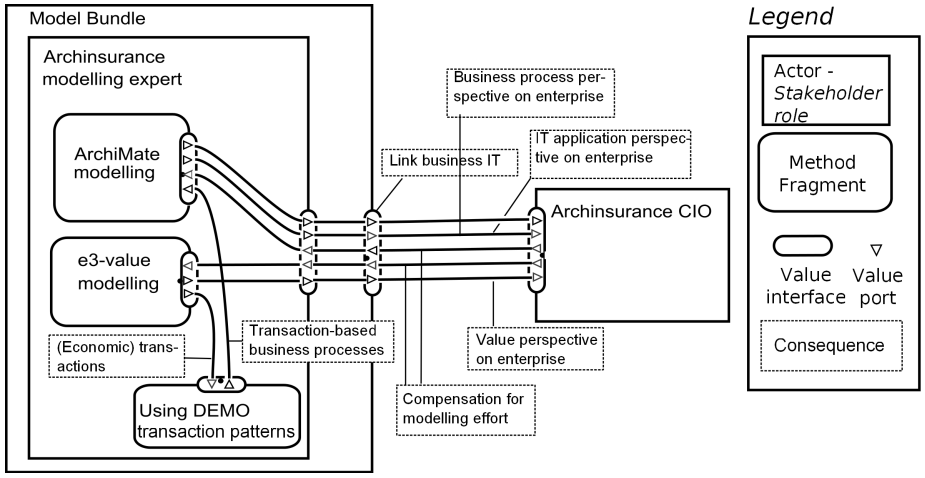

Figure 1: The {e^3*value*, DEMO, ArchiMate} bundle, representing the complimentariness of techniques of the experiment reported in [6].

3. CONCLUSIONS AND FUTURE WORK

In this paper, we introduced e^3*RoME*, a value-based approach for creating interesting combinations of method fragments. We discussed how a value-based matchmaking mechanism for service bundling is reused for what we coined "method bundling". Reflecting upon a formalization of the pragmatics of a method integration experiment, to capture the value of method fragments using e^3*service* as a basis seems promising. Yet, validation in a real-life setting should further confirm this. For further future work, we expand on the notion of modelling costs, and reviewing the extent to which modelling costs and benefits can be quantified. Finally we should continuously ensure the RoME of e^3*RoME*. Otherwise the irony may be that e^3*RoME* does itself not justify the required Return on Modelling Investment.

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