Embracing Pragmatics

Marija Bjeković[1,2,3], Hend*erik* A. Proper[1,2,3] and Jean-Sébastien Sottet[1,3]

[1] Public Research Centre Henri Tudor, Luxembourg, Luxembourg
[2] Radboud University Nijmegen, Nijmegen, Netherlands
[3] EE-Team, Luxembourg, Luxembourg*
{marija.bjekovic,erik.proper,jean-sebastien.sottet}@tudor.lu

Abstract. In enterprise modelling, we witness numerous efforts to predefine and integrate perspectives and concepts for modelling some problem area, which result in standardised modelling languages (e.g. BPMN, ArchiMate). The empirical observations however indicate that, in actual use, standardising and integrating effect of such modelling languages erodes, due to the need to accommodate specific modelling contexts. Instead of designing yet another mechanism to control this phenomena, we argue it should first be fundamentally understood. To account for the functioning of a modelling language in a socio-pragmatic context of modelling, we claim it is necessary to go beyond a normative view often adopted in modelling language study. We present a developing explanatory theory as to why and how modelling languages are used in enterprise modelling. The explanatory theory relies on a conceptual framework on modelling developed as the critical synthesis of the existing theoretical work, and from the position of socio-pragmatic constructivism.

Keywords: model, modelling language, language use, pragmatics

1 Introduction

In the field of enterprise modelling, a number of *fixed* modelling languages, e.g. [31, 32, 23, 53, 17], is defined for creating models for different purposes. Most of these languages have the ambition to provide a standard way of modelling some problem area, for different uses and stakeholders. This promises to enable tool development and increase of productivity in modelling, to facilitate knowledge transfer and communication about the problem area, etc.

However, a growing empirical material indicates that, in actual use, the standardising effect of such modelling languages erodes. This can be observed in the emergence of dialect-like and/or light-weight variants of the original language, e.g. [55, 29, 13, 7, 1, 34, 27], and specific extensions of standards intended to deal with 'missing aspects', e.g. [23, 8]. The empirical reports [1, 7, 27, 29, 37, 55] suggest that such language variants emerge to compensate for the inability of fixed modelling languages to aptly fit specific modelling situations. In an extreme case, the practitioners favoured ad-hoc and semi-structured notations [29, 1], despite

* www.ee-team.eu

the loss of potential benefits. For instance, the preference of business architects for home-grown semi-structured models in early and creative phases of enterprise modelling is reported in [1], as they allow delayed commitment to syntax, and closer fit to the needed way of thinking.

While such compensatory strategies enable practitioners to overcome problems with modelling languages used, they also potentially lead to a redundant work. Moving from semi-structured models to more formal tasks, an additional effort is needed to enter them in a dedicated modelling tool. Likewise, more structured models need to be distilled into 'boxology'[4] to be communicated back to stakeholders [29]. This diminishes perceived benefits of using modelling languages, but also prevents further maturation of modelling practices.

In our view, the problem comes from the fact that language engineering efforts typically overemphasise the challenges of mechanical manipulation of models, and neglect the variety of contexts, users and purposes for which models need to be created. Adopting a utility-oriented perspective on modelling languages [33], we argue that this variety needs to be better understood and more explicitly accounted for in language engineering efforts.

We will argue that the value of a modelling language is inherently related to its use [33], and that the role of language in a wider socio-pragmatic context of modelling needs to be better fundamentally understood. To do so, we believe it is necessary to go beyond a strictly normative view often adopted in design and evaluation of modelling languages [46], and favour a broader perspective [14, 49] in their studies.

The paper is part of an ongoing effort to develop an *explanatory theory* as to why and how fixed modelling languages are used within enterprise modelling. We present a matured version of initial ideas reported in [5, 4]. This maturation refers to a clearer and explicit theoretical grounding of the framework, and evolved and consolidated reflection, supported with further theoretical evidence.

In the paper, we discuss our theoretical grounding in Section 2. Our fundamental view on modelling is presented in Section 3, Relying on this view, our theoretical understanding on the role of language in modelling is developed in Section 4. The next steps of this research are outlined in the conclusion.

2 Theoretical Grounding

Our research is motivated by a long-term desire to improve the design of enterprise modelling languages and frameworks, and to align them better with the needs of their (potential) users. Although fitting into a design-oriented research philosophy [19], in our research we do not aim at a design theory [18]. Our primary focus is on its *rigour cycle* [19], i.e. on an *explanatory theory* [18]. We expect that the explanatory theory feeds the knowledge base [19], and contributes to the foundation for a modelling language design theory.

[4] This term was used by one of the enterprise architects in exploratory interviews to refer to the informal diagrams created on the basis of more elaborated models for the purpose of stakeholder communication.

We justify the *relevance* of our research subject based on: (1) empirical reports on enterprise modelling practice, which identify the need to adapt modelling languages to specific modelling tasks, and pinpoint at the lack of such flexibility in existing modelling infrastructures [1, 7, 27, 29, 37, 55]; (2) our own past experiences with UML [31], ArchiMate [23], i* [53] and e3Value [17] across different enterprise modelling tasks; (3) our observation of continuous extension and increasing complexity of ArchiMate and BPMN standards, contrasted to their practical usage [4].

In our research, we adopt an inherently *pragmatic orientation* on models and modelling languages. We see them as *means-to-an-end*, i.e. particular instruments that should provide some *value* when used for the intended goals by the intended users. We understand *models* as essentially means of representation of some socially constructed knowledge [45, 51]. We understand *modelling* as the process of constructing, representing and sharing this knowledge between people involved, where communication has a fundamental role [12, 22]. *Modelling languages* are studied primarily from the perspective of their utility [33] for constructing, representing and sharing this knowledge (through models) by the people involved in modelling. Such an orientation on the phenomena of modelling is strongly related to our choice of *epistemological* and *ontological position* of socio-pragmatic constructivism [51].

The explanatory theory is developed by combining *analytic* and *interpretative research*. As for the analytic part, the theory relies on our conceptual framework on modelling (Section 3), which is developed through a critical synthesis of the selected theoretical work [39, 36, 12, 22, 33, 42, 25]. Given the space limitation, the details of this synthesis won't be elaborated in the paper. Furthermore, our theoretical understanding of language functioning in modelling is grounded in functional linguistics [11, 10], cognitive linguistics [16], cognitive science [48] and semiotics [40]. The presently developed theoretical synthesis is then coupled with a number of interpretative case studies. They should serve both as a preliminary evaluation of the theory, and the source for its further maturation.

Although some elements of the theoretical framework are general, and thus applicable to conceptual modelling, we empirically study the functioning of modelling languages only within enterprise modelling, and the empirical evaluation of the theory will only take place in this context. Therefore, we presently restrict the *application domain* of our theory to enterprise modelling.

3 A Fundamental View on Modelling

3.1 Model Definition

Our general model definition is inspired by [39, 36, 12, 41]. In our view:

> *A **model** is an artefact acknowledged by the observer as representing some domain for a particular purpose.*

By stating that a model is an **artefact**, we exclude *conceptions* [12], or so-called mental models, from the scope of this definition. Conceptions are *abstractions*

of the world under consideration, adopted from a certain perspective, and share this property with models. However, a conception resides in the mind of a person holding it, and as such is not directly accessible to another human being. To communicate the conception, it has to be externalised. While conceptions reside in mental space, models are necessarily *represented* in physical/material space. This being said, we do consider conceptions to be fundamental to modelling. This point is elaborated later in the section.

The **observer** in our definition refers to the group of people consisting of model creators and model audience. On one extreme, it can refer to the entire society, on the other extreme, to the individual. Though it may not be the general rule, it is very often the case, in an enterprise modelling context, that model creators are at the same time its audience. We take the position that the observer is the essential element in modelling. The discussion in the rest of this section provides support for this claim.

A **modelling situation** is *at least* characterised by the wider context to which a modelling effort relates (e.g. particular organisation, project), the involved observer and goals of modelling. Though the goals of modelling are not necessarily restricted to the goal of model creation[5], our immediate focus is on the latter goals, i.e. on model purpose.

Similarly to [12], we define **domain** as any 'part' or 'aspect' of the world *considered relevant by the observer* in the given *modelling situation*. The term *world* here refers to 'reality', as well as to possible worlds [15, 52, 28][6].

The **purposefulness** dimension of models is present in most model definitions, and is often considered as the main discriminant of the model value [39, 36, 41]. However, the notion of purpose is rarely defined, and its role in the modelling process is scantly discussed in the research. Based on [42, 36, 39], we currently understand **purpose** as aggregating the following interrelated dimensions:

(1) the **domain** that the model pertains to, and
(2) the intended **usage** of the model by its intended **audience**.

In other words, the reason why an observer creates a model in the first place is to enable some *usage* of that model (e.g. analysis, sketching, execution, contracting etc.) by its intended *audience* (e.g. business analysts, business decision-makers, enterprise architects, process experts, etc.).

3.2 Modelling Process and Role of Purpose

To discuss the role of purpose in the modelling process, we propose to identify its three essential streams: (see Figure 1): *abstraction*, *manifestation*, and *evaluation*. Though these streams are typically interrelated and not clearly differentiated in a real modelling process, this distinction is kept for analytic purposes.

[5] Particularly, organisational learning, achieving consensus/commonly agreed knowledge on a topic, are very important in enterprise modelling efforts [7, 6].
[6] Even more, the domain of a model can be another model as well [39].

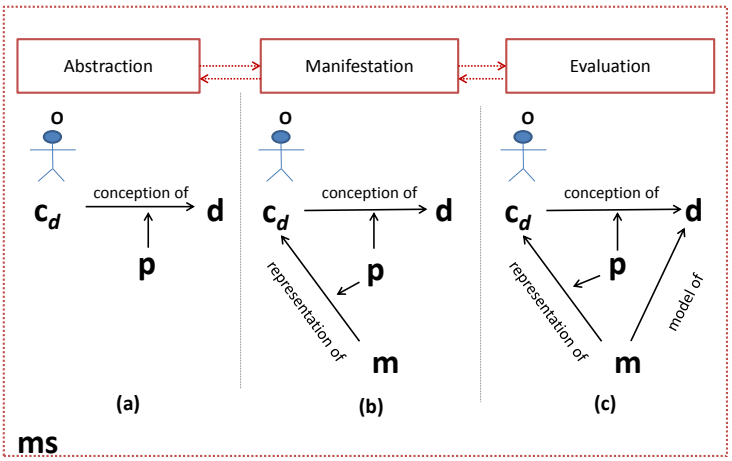

Fig. 1. Essential streams of the modelling process

Let us consider the proposed streams in a modelling situation **ms** involving an *individual* observer **O**, and the purpose **p**. This is illustrated in Figure 1. We assume here that **O** is aware of **p**, i.e. of intended use and intended audience of the model to be created, and more or less aware about the (possible) domain **d**.

Abstraction refers to the stream in which the observer **O** delimits the relevant 'aspects' of the world under consideration (i.e. domain **d**)[7]. The identification of relevant and *abstracting away* from the irrelevant 'aspects' of the world yields the observer's *conception of the domain* $\mathbf{c}_d$ and the relationship *conception of* (see Figure 1a). Note that $\mathbf{c}_d$ is in itself an *abstraction* of the considered domain, though not yet externalised at this point. It is also important to underline that the mechanism of abstraction, lying at the core of human cognitive capacities [44], is always *relative* to the cognitive task at hand [44, 36]. So, in a modelling situation **ms**, $\mathbf{c}_d$ depends on the observer's judgement of the relevance of some 'aspects' of the world, relative to the wider context of **ms**, and the purpose **p**. In other words, we assume that the purpose **p** influences the creation of the relation *conception of*, as illustrated in Figure 1a.

As pointed out in [39], strictly speaking, the selection of relevant 'aspects' of the world does not always follow the purposefulness criterion. In our work, we assume that the observer tends to *purposefully* conceive the domain[8].

Manifestation refers to the externalisation of $\mathbf{c}_d$ in the physical space. The observer **O** tries to shape an artefact (i.e. model-to-be) **m** in such a way that it adequately *represents*, for the purpose **p**, his/her $\mathbf{c}_d$. From this emerges the

[7] In conceiving the domain, the observer is not limited to using only his/her senses to *perceive* [12] and interpret 'reality'. S/he uses all his/her cognitive abilities, including creativity or imagination, particularly when conceiving possible worlds [15].

[8] We exclude from consideration the potential conscious *political intentions* underlying the observer's judgement.

representation of relationship between the artefact **m** and the $\mathbf{c}_d$. The Figure 1b illustrates both this relationship and the influence of **p** on it.

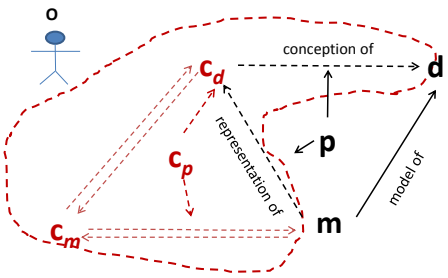

Fig. 2. Aligning of conceptions

At this point, it should be noted that the observer's understanding of the purpose **p** is essentially a conception as well, i.e. the conception of the purpose of the model-to-be $\mathbf{c}_p$. Even more, the observer **O** also forms the conception of the model-to-be, $\mathbf{c}_m$. This is illustrated in Figure 2. The heart of modelling thus actually consists in the gradual alignment of these three conceptions (i.e. $\mathbf{c}_d$, $\mathbf{c}_p$, and $\mathbf{c}_m$) by **O**, in parallel with the very shaping of the artefact **m**. Therefore, potentially neither of conceptions is completely stabilised before the artefact **m** is shaped in a satisfactory manner. The alignment of the three conceptions is driven by the observer's evaluation of the *fitness-for-purpose* of the artefact **m**.

Evaluation refers to the evaluation of the *fitness-for-purpose* **p** of the produced artefact **m** by the observer **O**. The adequacy of the *representation of* relationship is here at stake, but also, by transitivity, that of $\mathbf{c}_d$ and *conception of* relationship (see Figure 1c). We embrace the view of [25, 36] that *fitness-for-purpose* primarily refers to the utility of the artefact for the intended purpose. The observer's judgement of artefact's utility involves trade-off between the expected value of using the model for the intended purpose and costs involved in its creation [6, 36]. When **m** is judged as *fit* for **p**, it comes to be acknowledged, by the observer **O**, as the model **m** for **p**. It is only at this point that the relationship *model of* comes into being. Given the previous discussions, it is obvious that the **p** is central for establishing the *model of* relationship, as illustrated in Figure 1c.

Collaborative Modelling. When it comes to a collaborative modelling situation, an observer consists of a group of **n** human actors involved in modelling, and supposed to *jointly* observe some domain **d** and come up with its model $\mathbf{m}_d$, for the purpose **p**. The great challenge in collaborative modelling consists in the fact that each participant forms its own conception of the domain $\mathbf{c}_d$, of the model taking shape $\mathbf{c}_m$, and of its purpose $\mathbf{c}_p$. In order to reach a shared view on the **d**, **p** and **m**, the co-alignment of potentially $\mathbf{n}\times\mathbf{3}$ conceptions has to take place. This is indeed considered as a critical step in collaborative modelling, where all the discussions and negotiations about the model take place [35, 7].

Artefact, Representation, Model. We would like to draw the reader's attention to the distinction we make between the notions of *artefact*, *representation* and *model*. In modelling, an observer can theoretically use *any* artefact (e.g. graphics, tangible object) as *sign*[9] when externalising his/her conception of the domain. In that context, the observer attributes to the artefact the function of *representation* of his/her conception [36]. Being a *model* is also a function of an artefact, a special case of the representation function [36]: the *model* function is attributed to the artefact only after the observer's judgement that the created artefact represents some domain adequately for a particular purpose. For an artefact to act as a model, the observer's judgement is absolutely essential. Prior to this judgement, an artefact acts still only as a representation, which, at some point of time, may or may not be fit for the given purpose.

Purposefullness as Essential. The purpose thus influences all the key steps of modelling in a non-trivial way. It is, at the same time, the main factor in judging the value of a created model. This influence is usually implicit in the modelling process. In line with [36, 41], we take the position that it should be made explicit when creating and using models. At least the model creator should be aware of the intended usage and audience of the model. Explicitly considering the purpose may facilitate the alignment of conceptions in modelling, and making value judgements about the model explicit. Furthermore, it can also aid in understanding the model by the users not originally involved in its creation.

4 Role and Use of Enterprise Modelling Languages

Based on the elaborated view on modelling, we argue that language used in modelling has a *twofold function*:

1. ***Linguistic function*** - The language used in a modelling situation should facilitate framing the discourse about a domain and shaping the observer's conception of a domain [21, 33]. With this respect, a fixed/standard modelling language provides a preconceived *linguistic structure*, a specific classification of concepts to be used in the discourse about the world [12]. This primarily relates to the *abstraction* stream of modelling (see 3.2).
2. ***Representational function*** - The language used in a modelling situation should facilitate expressing the conceived domain in a purposeful model. With this respect, a fixed/standard modelling language provides a preconceived *representation system*, relating primarily to the *manifestation* stream of modelling (see 3.2).

Traditionally, modelling language design and evaluation studies focus on the study of its *representation system*, overemphasising the challenges of its mechanical manipulation. These studies adopt a strictly normative view on modelling

[9] Even more, the artefacts used may have their primary function very different from the function they are given in modelling.

languages. While this view allows for the effective treatment of the representation system, it also disregards the variety of contexts, users and purposes that this system is intended to serve. Such a narrow focus is, in our view, due to the lack of fundamental consideration of language functioning in conceptualisation and communication activities of modelling, i.e. of the linguistic function of the modelling language. Inspired by e.g. [14, 49, 21, 42], we build our understanding of the linguistic function in the present section. We then use this understanding to discuss the phenomena of interest in our research, i.e. the potential causes of the modelling language adaptation in its use in enterprise modelling situations.

4.1 Representational Function

As already stated, representational studies typically conceive the modelling language as a purely *representation system* of a *normative character*, which provides constructs and rules to be respected when creating representations. The representation system is usually defined in terms of abstract syntax, semantics and notation (i.e. concrete syntax) [24]. At least its abstract syntax has to be known *prior* to developing tools that implement manipulations over the representation system. For the needs of machine readability, both its abstract syntax and semantics need to be a priori *formally* (i.e. precisely and unambiguously) defined. This is usually achieved using mathematics.

While a *normative* (and *formal*) specification of the representation system is a prerequisite for obtaining predictable results from its mechanical manipulations [3, 24], the assumption that these properties, required for purely technical manipulation, have to hold in the use of modelling languages across different modelling situations has to be questioned. For instance, projecting a *normative* character to the language is typical for language standardisation efforts. The standardised definition of a modelling language is expected to, on its own, increase the clarity of communication, and act as a common language across various modelling situations and audiences. Similarly, the influence of symbol's visual appearance and 'labels' (natural language words naming the syntactic constructs) on the (standard) language understanding and, consequently, on the creation of conceptions is not seriously taken into consideration. Although necessary for technical purposes of models, the normative perspective on the modelling language is untenable in the realm of its human use, as it denies the principles of socio-cognitive functioning of languages [51, 16, 11, 10], as well as of the intersubjective nature of conceptual knowledge [50, 45].

More fundamentally, the normative perspective on modelling languages reflects, even if implicitly, a positivist orientation on the phenomena of *knowledge* and *language* [50, 12, 28]. Its underlying assumption is that the reference between language symbols and entities (already present) in the real-world can be established independently of a human mind and wider socio-pragmatic context in which the language is situated. These assumptions are furthered in the work of [46], prescribing (presumed universal) ontological constructs for representation systems modelling real-world phenomena. This approach reduces semantic phenomena to (presumably objective [49]) *referential type of meaning* [42], while

the need for the formal specification of semantics further cuts it down to just a syntactic representation, i.e. *syntactic semantics*.

4.2 Linguistic Function

To properly understand the functioning of the modelling language in modelling, it is however necessary to go beyond this strictly normative view. This first of all concerns the need to better understand the linguistic function of modelling languages. We propose to do so through grounding in functional linguistics [11, 10], cognitive linguistics [16], cognitive science [48] and semiotics [40] (in line with the adopted paradigm of socio-pragmatic constructivism).

According to socio-pragmatic constructivism, human cognition is always situated in a social context of shared practices and culture. Language emerges from, and is continuous with, *socially and culturally situated cognition* [16]. Its primary purpose is to objectify and communicate experiences among members of a community [49, 16, 10]. *Structurally*, language organises and stores knowledge in a way that reflects the needs, interests and experiences of individuals and cultures [16]. This knowledge is organised in terms of idealised conceptual/linguistic structures [9], reflecting the world as constructed by a community. *Functionally*, language mediates the processes of reality construction and cognition[10]. Finally, language is constantly *revised*, following the evolution of experiences and knowledge of the community, and depending on the *communicative usefulness* of pre-existing linguistic structure [16, 11].

Consequently, *common language* is grounded in common practices, i.e. communities of practice, as it is "*only in such communities that objectifications by means of language develop a stable yet not fixed meaning that enables the members of respective community to communicate effectively and efficiently.*" [49, pg.4307]. Different communities thus imply different 'realities' and languages [51].

As for the *meaning phenomena*, semantics is not considered as having an objective nature, i.e. the world is not objectively reflected in the language [49, 16]. The meaning of linguistic expressions (i.e. symbols) arises in *their actual use*, within a particular *communication situation* and *purpose*. The very act of attributing meaning to linguistic expressions is context-dependent[11]. This act of human judgement actually establishes the *reference* between a symbol and its referent [50], which implies that the reference itself only arises in the particular communication context [11]. The role of pre-existing and idealised structures accumulated in the language (as spoken within a particular community) is to make the act of conceiving and encoding a conceptualisation in a linguistic expression (i.e. attributing meaning to it) cognitively more efficient [38]. We refer to this perspective on meaning as *pragmatic semantics*.

We argue that, when used in the abstraction stream in a modelling situation, the preconceived linguistic structure embedded in the modelling language is used

[10] This view is in line with the weak formulation of *linguistic relativity* hypothesis [43].

[11] The pervasiveness of communication background [48] or context [10, 11] for linguistic meaning is thoroughly discussed in e.g. [10, 48, 11].

according to the discussed principles of natural language functioning[12]. These principles are not artificially imposed but intuitive to any human being, as they are profoundly rooted in the organisation and functioning of a human cognitive apparatus [16]. It can thus be assumed that these principles cannot be easily overridden by the rules of a normatively defined artificial language.

The preconceived linguistic structure embedded in the modelling language thus primarily has an *instrumental role* in shaping the discourse and conceiving the domain (in cognitively efficient and communicatively useful) way. In other words, the *value* of such linguistic structure depends primarily on its *utility* for the mentioned tasks. However, the modelling language is typically imposed onto the modelling situation from the outside, and is not rooted the wider socio-pragmatic setting of the modelling situation. This suggests that a preconceived linguistic structure of a modelling language will not be able to effectively and efficiently support a wide variety of modelling situations. It is therefore natural to expect an intuitive human tendency to adapt the linguistic structure so that it matches the pragmatic focus of modelling [20].

4.3 Variety in the Use of Enterprise Modelling Languages

In our view, this understanding of linguistic function is in particular relevant for an enterprise modelling effort. This effort typically aims to describe, understand or alter the existing (primarily) social structures and practices of the enterprise, e.g. by creating new strategy, services, processes, architectures, introducing new technologies etc. Reaching the consensus and shared understanding of the modelled phenomena among stakeholders is often mentioned in the literature as the key factor of success of enterprise modelling projects [7, 37]. For these reasons, we believe an adequate linguistic structure in the abstraction stream of an enterprise modelling situation is crucial in conceiving of enterprise 'reality' through models. In other words, there will be an intuitive tendency to adapt the modelling language, in case the provided support is not effective and/or efficient. In the following, we explore some potential causes affecting the adaptation of the used linguistic structure (i.e. abstraction variety), and, consequently, of the used representation system (i.e. manifestation variety).

Abstraction variety. The major challenge in using any modelling language, imposed from the 'outside' onto the modelling situation, consists in the fact that it is most likely not grounded in common practices of the observer. To act as, or override an existing, *common language*, the imposed linguistic structure has to be first made sense of, i.e. it has to be *situated* within the actual enterprise modelling situation. This can be a challenging task.

First of all, many factors are likely to affect a general understanding of the linguistic structure by the observer: his/her preconceptions [33], his/her abstraction capacity [47], level of expertise and experience with the given modelling lan-

[12] Different authors have pointed at the relevance of linguistics in studying modelling languages, e.g. [12, 14, 20, 41]. Some empirical support for this may also be found in the study of use of BPMN constructs in [55].

guage, modelling language complexity, etc. While these factors are discussed in detail in [4], we would like to only underline here that their inadequate handling increases the likelihood of *cognitive overload* [2] of the observer (especially but not only of non-modelling-experts [1, 29]), when s/he *only* tries to understand the language. Consequently, the remaining cognitive resources in working memory [2] may be insufficient to focus on the primary modelling task. Humans will intuitively tend to avoid such a situation, by simplifying the language used [55, 13], or even dropping the standard language in favour of a home-grown language actually grounded in an existing organisational practice [1, 29].

Secondly, given *the lack of situatedness* of the linguistic structure, the latter is also likely not to cover all topics (i.e. knowledge) relevant for intended modelling situations. Indeed, the topical relevance is highly situation-dependent: different topics may be relevant for different enterprises, even in different transformation projects of the same enterprise. New topics may also become relevant as the result of the evolution of the enterprise. It is thus nearly impossible to a priori incorporate all potential topics in a preconceived modelling language. We discussed that the drive to adapt/extend the used linguistic structure to increase its communicative usefulness will be present. The compensatory strategies such as e.g. using tags, notes, additional models, etc. to compensate for 'missing aspects' may emerge in the absence of language/tool flexibility [34, 27, 8].

Manifestation variety. Although not clearly separable from the previous discussion, we presently focus on challenges of using the language's representation system to create a *purposeful* representation, i.e. model. As discussed in Section 3, model purpose has the essential role in creating the representation, and in evaluating its utility. As model is created to *enable* some usage by some audience, specifically human audience, the *cognitive effectiveness* [30] of created representations for human communication should be optimised. The inadequate language support increases the costs of model creation, but it can also affect the usability of the model for the intended purpose. This is quite likely to happen when using representation systems overly tuned towards technical purposes of models. Consequently, there will be a drive to adjust such representation systems, e.g. to simplify or use just enough constructs. This reflects the intuitive human attitude to maintain a *pragmatic focus* [20] in their linguistic communication [11, 16]. In our view, this underlines the emergence of informal and light-weight variants in explorative phases and for models oriented towards communication with stakeholders [7, 13]. In line with [30], we also suggest that, within the same linguistic structure, multiple representational variants can be expected to occur (and should exist), each rooted in intended (classes of) model purposes.

5 Conclusion

In this paper, we have argued that the phenomena occurring in the actual use of modelling languages requires a fundamental understanding. With regards to enterprise modelling, our research offers a broader perspective in which the (modelling) language is studied as tightly related, in terms of its structure and func-

tioning, with the practices and culture of the community it serves. From this stance, we argued that the 'dialectisation' of enterprise modelling languages is due to the crucial role of their linguistic function in these efforts.

To deepen the understanding of suggested factors affecting the effectiveness of the linguistic function, a number of interpretative case studies is foreseen. Within each case, we plan to conduct in-depth interviews, observations and analysis of the relevant artefacts (models, languages) used. Thus obtained empirical insight should allow for preliminary evaluation of the theoretical framework and for its further theoretical elaboration.

At least from a theoretical point of view, we expect that our framework contributes to language engineering efforts with insightful guidance. We believe that, at least in enterprise modelling, both representational and linguistic function of modelling languages should be carefully balanced and adequately accommodated in language engineering. With this respect, potentially more evolutionary [28] and flexible approaches to language engineering might be advised in the light of practical needs for language support. Indeed, a growing interest in these approaches within different academic communities may be observed, e.g. [26, 30, 54]. Such ideas will be evaluated in the empirical evaluation in our future work.

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