

# Toward Modeling Strategic Plans: Requirements & Language Design Considerations

(*Research-in-Progress Paper*)

Arne Bergmann\*, Stefan Strecker\*

\*Enterprise Modelling Research Group, University of Hagen, Germany

Email: {arne.bergmann, stefan.strecker}@fernuni-hagen.de

**Abstract**—Strategic planning constitutes an essential managerial task. The existence of a coherent and a consistent strategic plan is considered a prerequisite for strategy implementation and execution. As a task, strategic planning requires a profound understanding of a firms competitive environment, organizational context and business operations. We investigate whether a domain-specific modeling method extending existing enterprise modeling methods can address essential requirements of the domain of strategic planning. As part of an on-going, multi-year design science research project, the present work motivates and justifies domain-specific requirements a method in support of strategic planning should satisfy, and identifies essential domain-specific concepts. Integration points with existing modeling languages are discussed, and initial drafts of concepts of a domain-specific modeling language (DSML) for strategic planning are outlined.

## I. INTRODUCTION

Management practice and literature recognizes strategy among its core topics and acknowledges its many facets, aspects and issues [1], [2]. Despite its significance in management literature, surprisingly different views are taken on what a strategy entails. Undisputedly, strategic planning is one of several steps characterizing the so-called strategy process in order to arrive at a coherent and consistent strategic plan [3, p. 346]. To support strategic planning efforts in practice, visual representations are regarded as an essential instrument when engaging in strategic planning (e.g., the “Balanced Score Card” or the “BCG-Matrix”) [4], [5]. Previous work has been dedicated to a critical reconstruction of such strategy analysis tools using enterprise models [6] concluding that enterprise modeling methods such as “Multi-Perspective Enterprise Modeling” (MEMO) [7] provide detailed organizational context relevant and necessary for strategic planning.

However, present enterprise modeling approaches do not provide comprehensive methodical support for strategic planning and do not suggest nuanced modeling concepts for representing strategic plans. Based on this assessment, the present work prepares for developing a modeling method in support of strategic planning by identifying, motivating and justifying domain-specific requirements such a modeling method should satisfy, and by suggesting first drafts of modeling concepts for creating conceptual models of strategic plans.

As part of an on-going design science research project, we extend and refine the existing conceptual foundation [6], prepare for the subsequent development of a domain-specific modeling method and refine high-level requirements for domain-specific modeling languages [8] (reducing complexity, improving transparency, fostering communication and collaboration). In the light of idealized design research processes (e.g., [9], [10]), the present work reports on the clarification of design goals and the development of domain-specific requirements (cf. phases 1 and 2 in [10]) as well as on language design considerations and key domain specific concepts and their semantics (cf. phase 3 in [10]).

In Sect. II, we discuss design goals and provide a brief overview of related work. Sect. III reconstructs essential concepts, motivates and justifies domain-specific requirements a modeling method for strategic planning should satisfy. In Sect. IV, we discuss issues and decisions regarding corresponding language concepts and outline promising paths for an integration with an existing enterprise modeling approach and its DSMLs. We conclude with a brief discussion of paths for future work on a modeling method in support of strategic planning in Sect. V.

## II. DESIGN GOALS AND RELATED WORK

The general goal of the prospective modeling method is to support the documentation, coordination and analysis of strategic plans as an interpretation of an intended strategy. Conceptual models of strategic plans are supposed to stimulate and foster the implementation of suitable organizational and technological measures for improving the basis of strategic planning. In particular, models created with the prospective modeling language should provide multiple perspectives, such as an organizational, a technological, and an informational perspective.

Accordingly, the overall design goal is to enhance present enterprise modeling approaches with constructs for modeling organizational strategic plans to enable a model-based and multi-perspective management of organizational strategic planning. For instance, prospective analyses should support inquiries such as: Which resources are needed to execute a strategic plan? Which internal and external factors are beneficial or detrimental to a certain strategic plan and why? Which factors are expected to change soon? Which organizational units and business processes are affected by a specific course of action? Which dependencies exist between a specific course of action and corresponding organizational goals and thus are critical for success? Which markets do we intend to serve with which products? On what sources of information do we rely on (e. g., regarding market information)?

### A. Related Work

Two different streams of related research contribute to our work. Firstly, enterprise modeling approaches such as ArchiMate [11], Multi-perspective Enterprise Modeling (MEMO) [7], or For Enterprise Modeling (4EM) [12] provide domain-specific modeling languages of importance to modeling strategic plans (e. g., for modeling risks, goals and resources). Secondly, there are other conceptual modeling approaches that support analyzing strategy-related topics such as strategic alignment [13], the creation of a business model [14] as well as goal modeling as a foundation for strategic planning [15], [16], [17]. A common approach is to start from “strategic decision trees” providing means-ends-relationships (e. g., [15], [18]) while other

approaches focus on specific abstractions providing strategy-related content (e. g., [19], [20], [14], [16]). Notably, however, these approaches do not emphasize comprehensive strategic plans. To conclude, related approaches lay a foundation for developing a modeling method in support of strategic planning. The present work aims to refine and further develop present modeling concepts to arrive at nuanced concepts to describe and (re)assess strategic plans, and to complement adequate methodical advice, i.e., a process model for creating and evaluating conceptual models of strategic plans entailing guidance for prospective users. Overall, and to the best of our knowledge, there is no domain-specific modeling method directly comparable to the one advocated in this paper.

## III. DOMAIN ANALYSIS AND REQUIREMENTS

The development of a modeling method, and in particular the design of a domain-specific modeling language, requires reconstructing key terms of the technical language of the targeted domain, i.e., reviewing their semantics in domain-specific use contexts, identifying subtle connotations, ambiguity and truncation and other particularities of natural language use [21]. A common approach to conceptual reconstruction is to review pertinent literature to analyze technical terms and other forms of representation of domain knowledge, e.g., graphical visualizations [21], [22]. For the present domain reconstruction, we turn to the literature on strategic planning to which we identify contributions from fields as diverse as strategic management, organization studies, game theory and social science.

This section provides an overview of essential aspects of the term strategy (III-A) and outlines a conceptual reconstruction of the term strategy as used in the domain of strategic planning (III-B). Further, we summarize key findings from reconstructing domain terminology concerning the fundamental understanding of strategies in the context of a strategic plan and propose specific concepts to be included in a strategic plan (III-C). Thus, this section prepares for the design of a domain-specific modeling language and method by gradually refining the conceptual reconstruction to arrive at adequate and useful conceptualizations relating to strategic plans as intended strategies.

### A. *Reconstructing the Concept of a Strategy*

Over the years, the discourses related to the concept of strategy have evolved into an own field of business management research, not at least due to the promises associated with a strategic orientation of an organization: reduce uncertainty, increase competitiveness, seize market opportunities and improve the resilience of an organization in times of crisis [23]. The concept of ‘strategy’ was and remains subject to a diverse body of literature (e.g., [1], [2], [23]).

The discourses around strategy can roughly be categorized into two basis notions on strategy: On the one hand, the concept of strategy is explained by content-related discussions and its key determinants, on the other hand, the concept of strategy is explained by its basic conception. In order to prepare and to account for a sufficient understanding for the concept of strategy with strategic plans, in the following, we briefly outline the these notions described in literature.

In the 1980s, considerable emphasis was given to the ‘market-based view’ of a strategy (MBV) [24], describing the firms competitive environment and its competitive position. In the following decade, further research suggested that the resources of a firm, rather than the external environment, may be another key determinant for explaining successful strategies and thus performance differences among firms [25]. Eventually, the increased focus on resources helped to clarify the contributions of resources to competitive advantage [26], [25] which gave birth to a number of descriptive frameworks (e. g., [27] and [28]). Porter’s contribution emphasized external, industry-based competitive ‘forces’ (MBV), while Wernerfelt reminded that a (self-)reflective view on the firm and its resources (RBV), rather than a particular product market combination may be of key importance when examining the determinants of a strategy [29, p. 1514].

Independent of these content-related discussions, the first and predominant conception in the early 1960s was that of a strategy as strict and prescriptive plan [2, p. 9ff.]. According to this interpretation, strategies are understood as a set of rationally planned activities to achieve a desired outcome (e. g., [30], [31]). In this conception, strategies

are a forward-looking description of meticulously planned activities outlining a path towards an overarching goal [32, p. 70]. Additionally, a plan may also be conceived as a ‘maneuver’ or a ‘ploy’ [2, p. 15]. Other works suggest that strategies may also be seen as a ‘pattern in a stream of actions’ providing a backward-looking interpretation and describing strategies as actual patterns of behavior (whether intended or not) [33, p. 67]. Moreover, strategy may also refer to a perspective where it is a deeply rooted way of an organization to perceive its environment. In this conception, strategies are seen as the ‘character’ of an organization [34, p. 47]. Additionally, a strategy may also be seen as a position, specifically a means of locating an organization in its competitive environment [23, p. 75]. Here, the term strategy becomes an instrument of intermediation between an organization and its environment. However, these conceptions do not necessarily exclude one another; plans may go unrealized while patterns may appear without anticipation. Plans are seen as ‘intended strategies’ whereas patterns are seen as ‘realized strategies’. Further, ‘deliberate strategies’ are intentions that existed previously and were realized whereas ‘emergent strategies’ are patterns that developed in the absence of intentions [2, p. 12].

On the whole, the concept of strategy encompasses several aspects on different levels of abstraction such as future intentions, present sentiments, and behavioral patterns from the past [2] at the same time. Additionally, it encompasses a wide range of content-related discourses such as the competitive environment [24] and internal perspectives of a firm [27], [28]. In summary, the concept of strategy has to be seen as a multi-dimensional concept and its fundamental understanding depends on the perspective(s) taken. Thus, it is a challenging task to adequately account for the concept of strategy within a conceptualization of strategic plans.

### B. *Requirements Regarding Strategic Planning*

In the following, we present a conceptualization of strategic plans as an interpretation of intended strategies (cf. Sec. III-A). Further, we discuss different aspects and particularities related to the managerial task of strategic planning and strategic plans.

**Requirement 1** - *The method should support different procedural schemes for strategic planning. It should allow for e. g., an iterative process as well as a linear sequence of tasks and should not impose a particular scheme on its prospective users.*

**Rationale:** The key idea of strategic planning as a managerial task is to establish an informational basis of the preconditions for a subsequent implementation of an intended strategy. To arrive at an adequate understanding of an intended strategy, the process of strategic planning helps to coordinate planning efforts and measure progress on strategic goals. However, an idea of an intended strategy occurs ‘around’ the strategy planning process rather than the systematic traversing through different stages of a prescriptive process to ‘manufacture’ a strategy [35]. In particular, this is a key argument against the managerial concept of strategic planning, which is criticized for ignoring organizational ‘realities’ [36, p. 13]. Accordingly, the modeling method should not support the notion that strategic planning processes follow a single prescriptive scheme. The creative processes of planning foster new and yet unknown insights and reveal problems such as chances and risks as well as ambiguities within the plan that demand for an appropriate ‘treatment’ which is often considered the main benefit of strategic planning [33, pp. 69–72]. Different activities within a strategic planning process may be performed cyclically and multiple times and, in consequence, may necessitate an adjustment of the strategic plan. Further, strategic planning typically produces a multi-page document in which the key items (concepts) are set out in writing [37, p. 13]. Hence, the method should support the notion that a strategic plan should be seen as a ‘dynamic’ or ‘living’ document supporting different schemes of strategic planning following different procedures. However, if considered a ‘living document’, strategic plans cannot be perceived as a final, but rather an intermediate and temporary ‘solution’ that describes an intended strategy at some point in time.

**Requirement 2** - *The method should support the design of a coherent and consistent strategic plan. It should provide a conceptualization and account for precise and elaborate representation of the concepts and their supposed influence and impact described in a strategic plan and thus support the*

*integration of the concepts (e. g., planned activities and resources) as well as their coordination.*

**Rationale:** Strategic activities need to be aligned in order to succeed [23, p. 75] and to generate synergy effects [38]. Hence, a meaningful coordination of activities fosters future potentials of success [38]. A strategic plan is considered an organizational instrument adequate to this purpose by documenting what to do with the obligation to coordinate the corresponding premises [37, p. 13]. To support the creation of a coherent and consistent strategic plan, a method should provide adequate concepts to aid identifying and describing the premises of the concepts and their relations to one another.

**Requirement 3** - *The method should provide the means to establish an intersubjectively traceable justification for the concepts and relations laid down in a strategic plan. It should provide the means to describe and to document assumptions in quantitative terms where possible and means for qualitative description where quantification is either not feasible or not appropriate.*

**Rationale:** Strategic planning aims to prevent misjudgments and promises a higher level of efficiency by contemplating future states and their potential repercussions in advance [37, p. 15]. From a systems theoretical point of view, this contemplation allows organizations not to adapt to an uncertain reality, it rather ‘creates a new reality’ to which the organization cautiously seeks to approach to (e. g., by describing outstanding courses of action and environmental states in the future) [39, p. 369], [40]. Then, the argument for planning is that it reduces complexity intentionally by focusing only on relevant aspects and, thus, helps to transform uncertainty into a supposed certainty while the future remains uncertain [41, p. 110]. A strategic plan thereby promotes linearity by deliberately reducing complexity of an almost infinite space of possibilities, characterized by the unpredictability of future events, their outcomes and their interrelations [41]. The ‘selection’ of relevant information is, however, characterized by the fact that the items in a strategic plan (e. g., goals, courses of action etc.) are subjective interpretations that may change over time and may be assessed differently. Notably, these subjective assessments may have profound consequences for an organization and thus demand

for a justification. Therefore, it is imperative to an organization to establish a basis of justification—a ‘rationale’ “for telling reasons for what one does in a way that will enable people ‘to see the point’ and to accept that it makes good sense to proceed as one did” [42, p. 27]. Additionally, since strategic plans draw upon information regarding the status quo and assumptions of future developments [37, p. 15], [43, p. 14] a method should provide a purposeful distinction in order to enable prospective analyses. The method should support the documentation of information processed and should support different means of quantitative and qualitative justification adequate to this purpose (e. g., by means of consensus, coherence or correspondence).

**Requirement 4** - *The method should provide perspectives specific to (groups of) stakeholders involved. A perspective should, as far as possible, correspond with the abstractions, concepts and (visual) representations known and meaningful to the targeted (group of) stakeholders. All perspectives should be integrated with each other to foster cross-perspective communication and cooperation.*

**Rationale:** Strategic planning involves stakeholders with different professional backgrounds and responsibilities as well as their specific sentiments about future developments and outcomes punctuating the importance of management participation along the entire length of the strategic planning process [44] (e. g., managers from different departments or external consultants). A method requires an integration of information relevant to the strategic plan contributed from various sources and has to take different perspectives of an organization into account [26], [25]. Hence, the representation of concepts and abstractions of the strategic plan should be familiar or at least readily assessable to the participating parties.

### *C. Requirements Regarding the Key Concepts of Strategic Plans*

In the following and in line with the previous argumentation, we argue to account for specific concepts in a strategic plan.

There are several generic proposals referring to what concepts should (as a rule) be included in a strategic plan. In particular, it is suggested that a strategic plan should include goals, specific courses

of action, the availability of resources, assumptions and predictions on future developments, as well as their qualitative and quantitative assessments [45, p. 275], [37, p. 14].

**Requirement 5** - *The method should provide purposeful concepts for modeling different types of organizational goals and their interrelations.*

**Rationale:** In management literature, the determination of goals is seen as a precondition to support organizational decision making by providing decision criteria [46, p. 205]. Every entrepreneurial activity requires the existence of explicit or at least implicit goals. Goals serve as a ‘yardstick’ for economic success by describing the achievement of a desired effect [47, p. 10]. However, these effects can be different in nature (e. g., reaching a decision, increasing focus or improving business processes) [48, p. 1]. Further, organizational goal systems comprise a number of interrelated organizational goals, which are pursued in the long term or for a certain period of time. It is argued that organizational goal systems can and should serve as a key orientation point for entrepreneurial activities [46, p. 205] and, hence, help to prepare future course of action.

**Requirement 6** - *The method should provide purposeful concepts for modeling organizational courses of action. It should also provide the means to account for an orchestration of courses of action.*

**Rationale:** Strategic plans need to specify courses of action to outline how organizational activities contribute to goals in order to provide direction. Moreover, any course of action has to be reasonable and feasible in practice when considering a subsequent implementation [36]. An artificially created segregation of the formation and implementation of the courses of action contradicts the very notion of a strategic plan. Furthermore, the timing of courses of action and the orchestration described in a plan are of strategic importance since poorly orchestrated strategic plans may not achieve a desired outcome and may even lead to detrimental effects [49], [50], [51].

**Requirement 7** - *The method should provide purposeful concepts for modeling the demand for and the consumption of resources described in a strategic plan. It should also provide means to account for different types of resources.*

**Rationale:** Since strategic planning involves ef-

forts directed at achieving the best possible use of the resources possessed by an organization [38], [52], a conceptual modeling method should provide purposeful concepts of different types of resources (e. g., tangible and intangible resources) as well as skills and competencies. This conceptualization follows from considerations of the RBV on strategy to include organizational resources [26, p. 172]. For example, it should be possible to describe financial, material and (direct) human resources as well as patents, trademarks or operational knowledge and skills. Furthermore, the method should provide means to describe the availability and utilization of resources within strategic plan (e. g., to assess its feasibility).

**Requirement 8** - *The method should provide purposeful concepts to describe and document markets, products and services, and their perceived benefits.*

**Rationale:** To generate profit, an organization has to be aware of its products it intends to offer and markets it intends to serve [53, p. 592–593], [23, pp.68–70]. Proponents of the MBV and RBV clearly state that the purpose of a strategy is to determine a ‘product/market scope’ [30, p. 119] or ‘the position in a market’ of an organization [54, p. 221], [55, p. 8]. In both views, strategies are a ‘blueprint’ of a company to describe how to generate profit. In order to anticipate a ‘fit’ [23, p. 75] or a ‘match’ [56, p. 3] between the market and the products offered, both must be taken into account: the perspective of a customer and that of a firm to provide a means of interaction. Then, strategic plans have to make statements on perceived values of a product (e. g., lower prices or high quality products) to account for this relation as well as an adequate description of the targeted markets and the products and services to be offered. For instance, a company intends to enter a new market (perceived as attractive) by offering (suitable) products which can be sold at slightly lower prices (e. g., by means of higher economies of scale). A method should provide concepts adequate to this purpose.

Please note, the concept of a business model builds upon central ideas similar to that of a strategic plan. However, a business model is not to be seen as an intended strategy but includes a number of concepts described by a strategic plan (e. g., markets, products and value propositions) [57,

p. 728–728]. Other than a strategic plan, a business model comprises far more detailed information concerning decision variables, cost structures, pricing methods and margins. With regard to an abstraction of strategic plans, such a level of detail is neither reasonable nor feasible.

**Requirement 9** - *The method should provide purposeful concepts for modeling the influence of the organizational environment within a strategic plan. It should provide the means to allow for a representation of how environmental factors affect the concepts of a strategic plan.*

**Rationale:** The identification, description and analysis of a firm’s environment is of vital importance and is considered a key determinant of a strategic plan in both views on strategy. Unarguably, environmental factors may influence the cast of a strategic plan decisively. However, environmental factors can be different in nature (e. g., legal restrictions, ecological and economic factors etc.) and may influence the way of doing business differently. For instance, the entering of a competitor into a market can have a restricting influence on a specific course of action while new legislation may have an enabling effect. To identify and to assess environmental factors and their effects on a strategic plan, instruments such as the SWOT (Strength, Weakness, Opportunities and Strength) and PESTLE (Political, Economic, Social, Technological, Legal and Environmental) analyses are frequently used. Such instruments typically distinguish between internal and external factors referring to elements suggested by the RBV and MBV (e. g., Porter’s five forces) [p. 212] [58]. The method should provide adequate concepts to describe internal and external environmental factors and their enabling and restricting influence.

**Requirement 10** - *A method should allow for integrating the concepts of a strategic plan in the context of an enterprise and link them to the surrounding action system which is composed of all relevant organizational entities (e. g., organizational units, business processes etc.). This demands for an integration with existing modeling languages.*

**Rationale:** To provide an adequate basis for communication about a strategic plan and to support analyses scenarios, the method should provide relevant organizational context such as the

organizational action system, its institutions and actors, their roles and responsibilities. Additionally, strategic plans may outline measures that affect various parts of an organization (e.g., organizational structures, business processes, IT landscapes and goal systems). For example, the establishment of a new subsidiary requires the adjustment of the organizational structure (e.g., business units and roles) and may affect different business processes, such as distribution or purchasing processes. The method should provide adequate concepts to describe relations to the organizational context and their presumable impacts.

#### IV. LANGUAGE DESIGN CONSIDERATIONS AND POTENTIAL POINTS OF INTEGRATION OF A PROSPECTIVE DSML

In the following, we address specific peculiarities of the domain in the light of the identified requirements. Further, we discuss central domain-specific concepts. The present research builds on the "Multi-Perspective Enterprise Modeling" (MEMO) method [59]. The rationale for choosing MEMO is based on several considerations: MEMO provides a variety of modeling concepts relevant to the modeling of strategic plans (e.g., organizational units, roles, resources, and goals), the specification of MEMO is publicly available and MEMO draws upon a language architecture extensible through DSMLs [60]. Figure 1 depicts an initial integration with existing modeling languages of MEMO which are highlighted by a colored rectangle attached to the meta type as suggested in [60].

The domain analysis has revealed several particularities of strategic planning and strategic plans that a prospective conceptual modeling method has to consider. First, strategy is a multidimensional concept that does not seem to offer viable abstractions of *strategy types* since the concept of strategy refers to a set of various related concepts (e.g., goal, resource etc.) and additionally represents partly deviant interpretations (cf. III-A). The same argument holds true for abstractions of *strategic plan types*. To model a strategic plan, we advise to provide prospective modelers to describe a specific course of action focusing on outstanding actions in the future and their organizational impact. However, there are various conceptions conceivable.

First, it is possible to model a *course of action type* as an abstraction of a general a course of action, outlined by a strategic plan. Yet, such an overall and general course of action remains too vague and does not provide purposeful criteria for specifying precise types of courses of action such as 'establish subsidiary' or 'liquidating business unit'. Therefore, we recommend abstractions of *initiative types* to model specific courses of action which, in sum, would outline an overall course of action of a strategic plan. Please note, this is consistent with the first conception while opening room for a more elaborate description. We suggest to describe an *initiative type* by a *Name* and a *Description* (cf. Fig. 1). *Description* is intended to provide an understanding of the intended purpose of an *initiative type*. *EstimatedCost* should outline a rough cost estimate for an *initiative type*. Additionally, we suggest the attribute *Priority* to outline the strategic importance of the initiative. Since the orchestration of a strategic plan is of importance, the modeling of a starting date and an end date is recommended. It is suggested to specify these attributes as intrinsic (depicted as a white 'i' on the meta type in Fig. 1). Intrinsic attributes, concepts and associations are instantiated only at instance level, and not at type level. The purpose of these attributes is to describe particular start and end dates of an initiative but only on instance level. It is suggested to relate *initiative types* to *goal types* using a specific *rationaleRelation* since initiatives are meant to support organizational goals. A meaningful interpretation of such an association presupposes that initiatives need a justification in order to be implemented. We suggest the attributes *Impact*, *Probability* and *Justification* where *Justification* has the auxiliary type 'rationaleSpec' reusing the concept for modeling rationales (cf. [61]). For describing (strategic) goals, we suggest reusing the concept *abstractGoal* and its specializations (e.g., *engagementGoal* or *symbolicGoal*) [48].

*Factor of influence types* describe another key concept since the identification, description and analysis of a firm's environment is of vital importance to a strategic plan. We strongly recommend considering *factor of influence types*. Besides the attributes *Name* and *Description* of *factor of influence types*, we propose to add *InternalOrEx-*

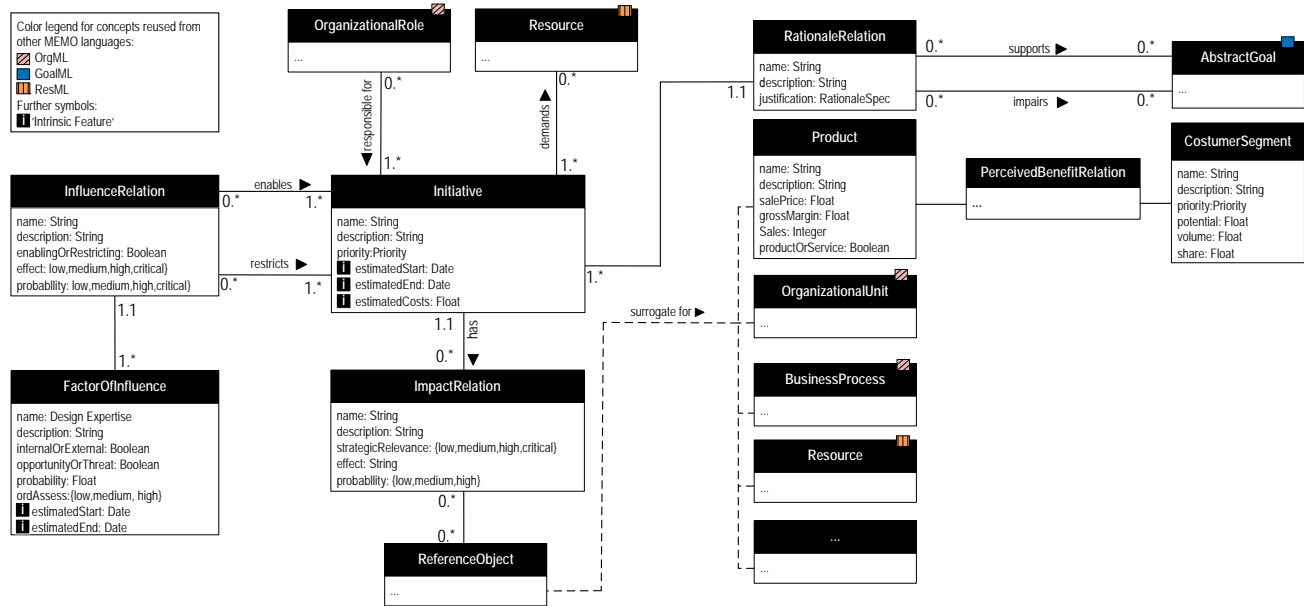


Fig. 1. Key Concepts and Potential Points of Integration

ternal. Another particularity refers to the perception and subjective assessment of the concepts in strategic plans. Therefore, we suggest *ThreatOrOpportunity* to further describe a *factor of influence type* as well as considering a starting and end date to outline a time frame (e. g., for legal restrictions, entering competitor etc.). Further, the integration of the modeling method RiskM [62] offers an auspicious point of integration to further describe *factor of influence types* by accounting for risks and chances. Additionally, associations are used to relate *factor of influence types* to *initiative types*. Attributes further describe this *influenceRelation* to specify characteristics. The attribute *EnableOrRestrict* is used to model this binarity, *Probability* is used to describe the anticipated probability and *Effect* for outlining a presumed effect of the occurrence of such an event. This conceptualization provides prospective language users with additional flexibility. Furthermore, due to the meta-level integration, it is possible to refer to relevant reference objects that can be reused from other MEMO languages to associate an *initiative type* with reference objects. Here, the concept *referenceObject* serves as a surrogate for concepts such as a *businessProcess* or an *organizationalUnit*. Instead of associating initiatives to other concepts directly, we suggest the concept *impactRelation* between *initiative type* and *reference*

*object type* to specify the relationship instead of qualifying the concept initiative in order to add more flexibility. The domain analysis has revealed that a comprehensible definition and documentation of products and services as well as the specification of corresponding markets should be considered when creating a strategic plan. To account for products and services, we suggest *product types* with the attributes *Name* and *Description*, *SalesPrice*, *Gross-Margins*, *QuantityOfSales* and their estimates (*EstimSalePrice*, *EstimGrossMargins*, *EstimGrossMargin*, *EstimQuantityOfSales*) to account for mandatory information regarding *product types*. Note that, *product types* may also be services. Therefore, we suggest the attribute *ProductOrService* as depicted in Fig. 1. Relevant market information is considered by *customer segment types* which are described further by the attributes *SalesPotential*, *SalesVolume*, *RelativeSalesVolume*. It is suggested to relate these concepts through a specific *perceivedBenefitRelation* to account for product-market-relations. The conceptualization of this relationship is intended to be augmented in future work. A further point of integration would be *resource types* modeled with ResML [63]. ResML enables the modeling of different kinds of resources such as intangible resources and tangible resources (e. g., IT components or human resources) as well as specific skills.



## V. CONCLUSIONS AND FUTURE RESEARCH

The contribution of this paper is twofold. Firstly, we present a domain analysis and provide a meaningful conceptualization of strategic plans by reconstructing the domain of strategic planning. Secondly, we discuss key concepts and their limitations and outline potential points of integration to an enterprise modeling approach. The discussion suggests that enterprise models provide a promising basis for modeling meaningful strategic plans which enable to provide an elaborate description of key concepts required. A corresponding process model which guides the use of the modeling language to support and foster strategic planning is currently, however, missing and remains on our research agenda. Specifically, we aim to complete the modeling method by complementing a domain-specific modeling language featuring a descriptive graphical notation with a corresponding process model. The method development entails developing analysis scenarios to demonstrate how prospective users can benefit from its use through demonstrating tasks specific to the domain (e. g., enable participating managers to discover a lack of rationale within a strategic plan, to incorporate different perspectives and to integrate different analyses and sources of information used within strategic planning (e. g., market analysis reports etc.)). In the process, existing modeling concepts may be reduced in complexity or specific details may be added. Additionally, the conceptualization of a strategic plan outlined in this paper offers a specific interpretation of intended strategies as strategic plans considered as a ‘living document’, yet taking deviant conceptions of strategy into account. Therefore, the present conceptualization is assumed to provide a promising foundation for scenarios regarding the analysis of an ‘evolution’ of a strategy identifying and analyzing emergent effects that determine patterns of behavior in strategic planning since this subject is a perennial topic in strategic management literature [2, p. 9ff.]. Finally, future research is dedicated to evaluate the practical application of the prospective modeling method. On that note, we already engaged in interviews with prospective users such as strategy consulting firms as well as managers entrusted with strategic planning tasks.

## REFERENCES

- [1] S. Cummings and D. Wilson, *Images of strategy*. Blackwell Oxford, 2003.
- [2] H. Mintzberg, B. Ahlstrand, and J. Lampel, *Strategy Safari*. New York City, NY: Free Press, 2005.
- [3] H. Mintzberg, Ed., *The strategy process: concepts, contexts, cases*, 4th ed. Harlow: Pearson Education, 2003.
- [4] D. N. Clark, “Strategic management tool usage: a comparative study,” *Strategic Change*, vol. 6, no. 7, pp. 417–427, Nov. 1997.
- [5] S. Stenfors, L. Tanner, and I. Haapalinna, “Executive use of strategy tools: Building shared understanding through boundary objects,” *Frontiers of E-Business research*, vol. 7, no. 2, pp. 635–645, 2004.
- [6] A. Bock, U. Frank, A. Bergmann, and S. Strecker, “Towards Support for Strategic Decision Processes Using Enterprise Models: A Critical Reconstruction of Strategy Analysis Tools,” in *IFIP Working Conference on The Practice of Enterprise Modeling*. Springer, 2016, pp. 41–56.
- [7] U. Frank, “Multi-perspective enterprise modeling: foundational concepts, prospects and future research challenges,” *Software & Systems Modeling*, vol. 13, no. 3, pp. 941–962, Jul. 2014.
- [8] —, “Some guidelines for the conception of domain-specific modelling languages,” in *Proceedings of the Fourth Enterprise Modelling and Information Systems Architectures Conference (EMISA 2011)*, M. Nüttgens, O. Thomas, and B. Weber, Eds. Bonn: Gesellschaft für Informatik, 2011, pp. 93–106.
- [9] K. Peffers, T. Tuunanen, M. A. Rothenberger, and S. Chatterjee, “A Design Science Research Methodology for Information Systems Research,” *Journal of Management Information Systems*, vol. 24, no. 3, pp. 45–77, Dec. 2007.
- [10] P. Verschuren and R. Hartog, “Evaluation in Design-Oriented Research,” *Quality & Quantity*, vol. 39, no. 6, pp. 733–762, 2005.
- [11] The Open Group, *ArchiMate 2.0 Specification: Open Group Standard*, ser. The Open Group Series. Zaltbommel: Van Haren, 2012.
- [12] K. Sandkuhl, J. Stirna, A. Persson, and M. Wißotzki, *Enterprise Modeling: Tackling Business Challenges with the 4EM Method*. Berlin, Heidelberg: Springer, 2014.
- [13] C. Giannoulis, J. Zdravkovic, and M. Petit, “Model-Driven Strategic Awareness: From a Unified Business Strategy Meta-Model (UBSMM) to Enterprise Architecture,” in *Enterprise, Business-Process and Information Systems Modeling*, W. van der Aalst, J. Mylopoulos, M. Rosemann, M. J. Shaw, C. Szyperski, I. Bider, T. Halpin, J. Krogstie, S. Nurcan, E. Proper, R. Schmidt, and P. Soffer, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2012, vol. 113, pp. 255–269.
- [14] Object Management Group (OMG), “Business Motivation Model (BMM),” Apr. 2016, version 1.3 (May 2015). [Online]. Available: <http://www.omg.org/spec/BMM/>
- [15] J. Horkoff, D. Barone, L. Jiang, and J. Mylopoulos, “Strategic business modeling: representation and reasoning,” *Software & Systems Modeling*, vol. 3, no. 13, pp. 1015–1041, 2014.
- [16] C. Rolland, N. Prakash, and A. Benjamen, “A Multi-Model View of Process Modelling,” *Requirements Engineering*, vol. 4, no. 4, pp. 169–187, Dec. 1999.
- [17] B. Hartmann, “Enterprise Architecture as an Instrument of Strategic Control,” in *Enterprise Modelling and Information Systems Architectures*, Hamburg, 2011.
- [18] E. S. K. Yu, “Modelling strategic relationships for process reengineering,” Dissertation, Graduate Department of Computer Science, Toronto, 1995.

- [19] C. Giannoulis and J. Zdravkovic, "Modeling strategy maps and balanced scorecards using istar," in *5th International i\* Workshop, Trento, Italy, August 28-29, 2011*, 2011, pp. 90–95.
- [20] A. Aldea, M.-E. Jacob, J. van Hillegersberg, D. Quartel, L. Bodenstaff, and H. Franken, "Modelling strategy with ArchiMate." ACM Press, 2015, pp. 1211–1218.
- [21] U. Frank *et al.*, "Outline of a method for designing domain-specific modelling languages," University Duisburg-Essen, Institute for Computer Science and Business Information Systems (ICB), Tech. Rep., 2010.
- [22] E. Ortner, "Language-critical Enterprise and Software Engineering," in *Proceedings of the Fourteenth Americas Conference of Information Systems, AMCIS 2008, Toronto, ON, Canada, Aug, 2008*, 2008.
- [23] M. Porter, "What Is Strategy?" *Harvard Business Review*, vol. 74, no. 6, pp. 61–78, 1996.
- [24] M. E. Porter, "The five competitive forces that shape strategy," *Harvard Business Review*, vol. 86, no. 1, pp. 25–40, 2008.
- [25] B. Wernefelt, "The resource-based view of the firm: ten years after," *Strategic Management Journal*, vol. 16, no. 3, pp. 171–174, 1995.
- [26] B. Wernefelt, "A resource-based view of the firm," *Strategic management journal*, vol. 5, no. 2, pp. 171–180, 1984.
- [27] C. Prahalad, "The Core Competence of the Corporation," in *Strategic Learning in a Knowledge Economy*, 2000, pp. 3–22.
- [28] C. E. Helfat and M. A. Peteraf, "The dynamic resource-based view: capability lifecycles," *Strategic Management Journal*, vol. 24, no. 10, pp. 997–1010, Oct. 2003.
- [29] I. Dierickx and K. Cool, "Asset Stock Accumulation and Sustainability of Competitive Advantage," *Management Science*, vol. 35, no. 12, pp. 1504–1511, Dec. 1989.
- [30] H. I. Ansoff, *Corporate Strategy: an Analytic Approach to Business Policy for Growth and Expansion*. New York: MacGraw-Hill, 1965.
- [31] K. R. Andrews, *Concept of corporate strategy*. Homewood: Richard D Irwin, 1987.
- [32] W. H. Newman and J. P. Logan, *Strategy, policy, and central management*. Cincinnati: South-Western Publishing, 1971.
- [33] H. Mintzberg, *Crafting strategy*. Boston, MA: Harvard Business School Press., 1987.
- [34] P. Selznick, *Leadership in Administration: A Sociological Interpretation*. New York: Harper & Row, 1962.
- [35] H. Mintzberg, "The Fall and Rise of Strategic Planning," *Harvard Business Review*, vol. 1, no. 72, pp. 107–114, 1994.
- [36] —, "Rethinking strategic planning part I: Pitfalls and fallacies," *Long Range Planning*, vol. 27, no. 3, pp. 12–21, 1994.
- [37] J. Wild, *Grundlagen der Unternehmensplanung*, 1st ed. Reinbek (bei Hamburg): Rowohlt, 1974.
- [38] J. B. Quinn, *Strategies for change: logical incrementalism*. Homewood, Ill: R.D. Irwin, 1980.
- [39] N. Luhmann, *Soziologische Aufklärung 3*. Wiesbaden: VS Verlag für Sozialwissenschaften, 1981.
- [40] K. E. Weick, "Organizational communication: Toward a research agenda," *Communication and organizations: An interpretive approach*, pp. 13–29, 1983.
- [41] A. Bäcker, *Rationalität als Grundproblem der strategischen Unternehmensplanung: Ein Beitrag zur Erklärung und Überwindung der Rationalitätskrise in der Planungstheorie*. Wiesbaden: Deutscher Universitätsverlag, 1996.
- [42] J. Habermas, *Theorie des kommunikativen Handelns*, 1st ed. Frankfurt am Main: Suhrkamp, 1981, vol. 1.
- [43] R. L. Ackoff, *Redesigning the future: a systems approach to societal problems*. New York: Wiley, 1974.
- [44] T. O'Shannassy, "Modern strategic management: Balancing strategic thinking and strategic planning for internal and external stakeholders," *Singapore Management Review*, vol. 1, no. 25, p. 53, 2009.
- [45] R. M. Grant and M. Nippa, *Strategisches Management: Analyse, Entwicklung und Implementierung von Unternehmensstrategien*, 5th ed. München: Pearson Studium, 2006.
- [46] K. Macharzina and J. Wolf, *Unternehmensführung: Das internationale Managementwissen: Konzepte – Methoden – Praxis*, 7th ed. Wiesbaden: Gabler, 2010.
- [47] G. Johnson, K. Scholes, and R. Whittington, *Exploring corporate strategy*, 8th ed. Harlow: Prentice Hall, 2009.
- [48] S. Overbeek, U. Frank, and C. Khling, "A language for multi-perspective goal modelling: Challenges, requirements and solutions." *Computer Standards & Interfaces*, vol. 38, pp. 1–16, 2014.
- [49] G. L. Lilien and E. Yoon, "The Timing of Competitive Market Entry: An Exploratory Study of New Industrial Products," *Management Science*, vol. 36, no. 5, pp. 568–585, May 1990.
- [50] G. Gennotte and B. Trueman, "The Strategic Timing of Corporate Disclosures," *Review of Financial Studies*, vol. 9, no. 2, pp. 665–690, Apr. 1996.
- [51] D. L. Sull and A. Ruelas-Gossi, "Strategic Orchestration," *Business Strategy Review*, vol. 21, no. 4, pp. 58–63, Dec. 2010.
- [52] A. D. Chandler, *Strategy and Structure: Chapters in the History of the Industrial Enterprise*. MIT press, 1962, vol. 120.
- [53] K. Hatten, D. E. Schendel, and A. C. Cooper, "A Strategic Model of the U.S. Brewing Industry: 1952-1971," *Academy of Management Journal*, vol. 21, no. 4, pp. 592–610, 1978.
- [54] J. Bracker, "The Historical Development of the Strategic Management Concept," *Academy of Management Review*, vol. 5, no. 2, pp. 219–224, 1980.
- [55] A. A. Thompson and A. J. Strickland, *Strategic management: concepts and cases*, 13rd ed. Boston: McGraw-Hill, 2003.
- [56] C. W. Hofer, "Some preliminary research on patterns of strategic behavior," in *Academ. of Manag Proceedings*, vol. 1973, no. 1. Academ. of Manag., 1973, pp. 46–54.
- [57] M. Morris, M. Schindehutte, and J. Allen, "The entrepreneur's business model: toward a unified perspective," *Journal of Business Research*, vol. 58, no. 6, pp. 726–735, Jun. 2005.
- [58] R. Gunn and W. Williams, "Strategic tools: an empirical investigation into strategy in practice in the UK," *Strategic Change*, vol. 16, no. 5, pp. 201–216, Aug. 2007.
- [59] U. Frank, "Multi-perspective enterprise modeling: foundational concepts, prospects and future research challenges," *Software & Systems Modeling*, vol. 13, no. 3, pp. 941–962, 2014.
- [60] —, "The memo meta modelling language (mml) and language architecture: 2nd edition," University Duisburg-Essen, Institute for Computer Science and Business Information Systems (ICB), Essen, Tech. Rep. 43.
- [61] S. Strecker, U. Frank, D. Heise, and H. Kattenstroth, "MetricM: a modeling method in support of the reflective design and use of performance measurement systems," *Information Systems and e-Business Management*, vol. 10, no. 2, pp. 241–276, Jun. 2012.
- [62] S. Strecker, D. Heise, and U. Frank, "RiskM: A multi-perspective modeling method for IT risk assessment," *Information Systems Frontiers*, vol. 13, no. 4, pp. 595–611, 2011, special Issue on Governance, Risk and Compliance Applications in Information Systems.
- [63] J. Jung, "Entwurf einer Sprache für die Modellierung von Ressourcen im Kontext der Geschäftsprozessmodellierung," Dissertation, University of Duisburg Essen, FB Wirtschaftswissenschaften, Duisburg/Essen, 2007, logos, Berlin.