A Design Science Perspective on Business Strategy Modeling

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Abstract. An important topic in the modeling for IS development concerns quality of obtained models, especially when these models are to be used in global scopes, or as references. So far, a number of model quality frameworks have been established to assess relevant criteria such as completeness, clarity, modularity, or generality. In this study we take a look at how a research process contributes to the characteristics of a model produced during that process. For example: what should be observed; what research methods should be selected and how should they be applied; what kind of results should be expected; how they should be evaluated, etc. We report a result on this concern by presenting how we applied *Design Science Research* to model business strategy.

Keywords: Business Strategy, Modeling, UBSMM, Design Science.

1 Introduction

The study of Information Technology (IT) utilization in organizations [22] is concerned with both the technological and social systems, as well as by phenomena emerging upon their interaction [31]. According to [45], an Information System (IS) encompasses the interaction of technological elements and people engaged to collect, filter, process, create, and distribute data. Hence, research within IT revolves around three related fields: Computer Science, concerned with development and code, Software Engineering, focused on production and operationalization of software, and Information Systems (IS), concerned with the use of IT in organizations facing managerial and organizational challenges [22].

Within IS, Design Science Research (DSR) is a problem-solving paradigm rooted in engineering; it aims to resolve distinct wicked problems by innovative artifacts through a development and evaluation circle against criteria of utility within an operating context (social setting, environment, domain, etc.) [34, 23]. DSR defines a process for building the constructs of the innovative artifact, such as models, methods and instantiations; the artifact itself and its use; as well as the environment within which the artifact is meant to be used for solving the addressed problem [23]. After the seminal publication of Hevner et al [23], design

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science research has been gaining wide acceptance as an research paradigm [21]. So far, the use of DSR has been reported in system modeling (e.g [53]), in enterprise modeling (e.g. [46]) and enterprise architecture (e.g. [35]).

When aiming to IS development to technically operationalize certain domain, data and data operations, models have always been fundamental [6]. System modeling entails the use of models to conceptualize a realm and build IS, where many modeling perspectives exist with respect to the IS aspects meant to be described (e.g. behavioral, functional, structural, etc.) [29]. Our research concerns business strategy modeling and integration into a unified business strategy meta-model for improving the alignment linkage between the *Business* and *IT*.

The objective of this paper is to present the experience and results of applying the DSR paradigm for the development of the Unified Business Strategy Meta-Model (UBSMM). In particular, we present the research process undertaken and reason over the methodological choices made to achieve the research goals set for addressing the alignment linkage using UBSMM.

Differences in research assumptions influence a series of concerns. For example: what should be observed; what kind of questions should be asked around the problem; how these questions should be structured; what methods should be selected and how should they be applied; what kind of results should be expected; how should these be analyzed and interpreted.

The paper is structured as follows: section 2 presents an overview of our business strategy modeling effort; section 3 discusses the research paradigm and philosophical assumptions underpinning the work; section 4 presents the research process followed for business strategy modeling using the Design Science Method [26] along with the methodological choices for the development of UBSMM; section 5 holds a reflective discussion on our outcomes, and section 6 concludes the paper along with some directions for future research.

2 Modeling Business Strategy: UBSMM

Business strategy is the determination of long-term objectives and courses of action using resources to achieve them [8]. Formulating business strategy provides the ways to timely change strategic thrusts and strategic capabilities [1].

Pervading all sectors of organizations, Information technology (IT) has become a fundamental factor for business strategy enactment. IT comprises the essential information needed to build the information systems (IS) to execute, support and facilitate business operations for delivering offerings to customers.

The continuous emergence of technological advancements necessitates more than ever before, alignment of *Business* and *IT*. Business strategy should be understood and communicated to define the means required for its successful execution, also making clear for IT what business stakeholders need. The alignment linkage between business strategy and IS is essential for the coordination of strategic initiatives with IS, to setup the infrastructure, design the processes, and define the capabilities required to support business operations [47].

Despite this acknowledged importance of aligning strategic initiatives and plans with IS, the linkage suffers from shortcomings of existing approaches making even

more difficult to grasp any view of strategic initiatives and facilitate the development of relevant IT solutions. Business strategy is typically linked to IS in an abstract way [33] or established business strategy formulations are often overlooked. When used, the linkage is heavily natural-language based, thus dependent on the specificities of the business strategy formulations and the IS models employed.

Our proposal to address these shortcomings has lead to development of the Unified Business Strategy Meta-Model (UBSMM) [18, 20], which integrates business strategy formulations within Strategic Management into a meta-model that enables linking with IS through model-level mappings. Such a model-centric proposal leverages characteristics of Model-Driven Development (MDD) such traceability [2], and also allows for the propagation and assessment of IS features and/or changes towards business strategy. With respect to the aforementioned shortcomings of current approaches UBSMM addresses two primary challenges: the a) domain modeled and b) its coverage:

a) Due to the ambiguity of business strategy formulations, typically natural language-based and accompanied with brief schematic representations, they are also ambiguous when compared to IS models that are build with well-defined syntax and semantics. This constitutes business strategy open to interpretation hindering common understanding and the linkage to IS.
b) The second challenge concerns domain coverage as there exist different perspectives of business strategy, which results in different formulations driven by different types of business strategy logic. Barney [3] identified three types of strategy-shaping logic upon the concept of competition in microeconomics, which he considered complementary to each other: the resource-based type, the industrial organization type, and the Schumpeterian (innovation) type. Similarly, more groupings of strategy-shaping logic exist, such as Mintzbergs ten school of thoughts [37], synthesized by defining strategy with five complementary ways; as a plan, as a plot, as a pattern, as a position, and as a perspective (the five Ps) [38] as well as using other base disciplines (i.e. psychology, political sociology, anthropology, etc.).

Overcoming these challenges and building UBSMM is based on iteratively integrating the conceptualizations of business strategy formulations. The fist UBSMM version has been required to at least aggregate the three complementary types from Barneys classification: Strategy Maps and Balanced Scorecards (SMBSC) [27] as an example of the resource-based type, the Value Configuration (VC), which consists of the Value Chain [44], the Value Shop and the Value Network [49] as an example of the industrial organization type, and Blue Ocean Strategy (BOS) [28] as an example of the innovation type.

This selection of business strategy formulations is not exclusive, thus other perspectives of business strategy can also be added and integrated to UBSMM, such as the ones of Mintzberg [37]. as well as future emergent ones. Figure 1 presents UBSMM as an aggregation of business strategy formulations (SMBSC-MM, VC-MM, BOS-MM), including others than can also be integrated, which as indicated from the Business Strategy Formulation MM). The integration of any business strategy formulation to UBSMM requires its conceptualization to undergo a similar schema integration process followed as the existing ones [18].

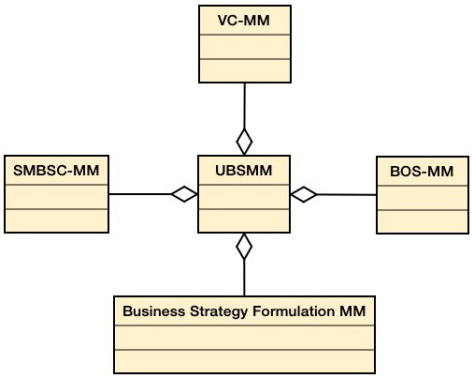

Fig. 1. UBSMM: an aggregation of Business Strategy formulation meta-models (MM)

3 Research Paradigm for Business Strategy Modeling

Typically, a research community shares a common set of beliefs and assumptions affecting the choice of research methods employed, namely a research paradigm, which shapes how its members perceive their discipline and consequently, how research methods are chosen [30, 26].

A research paradigm is characterized by philosophical assumptions expressed as concerns about reality (ontological), knowledge (epistemological), ways to examine reality for knowledge (methodological), and values (axiological). Within a discipline, these assumptions altogether position a researcher's belief system and view of the world towards the research problem being addressed, providing thus, rationale for the choice of the methods for actualizing the research process.

Ontological concerns focus on reality and the researcher's stance towards the nature of reality; what exists, what is derived [52] and [26]. Epistemological concerns focus on knowledge; how can people gain knowledge about the world, what does it depend on, how can one be sure of what they know [52, 26]. Methodological concerns focus on the appropriateness of the ways and procedures used to examine reality as well as the validity of the knowledge produced from them [52, 26]. Axiological concerns focus on people's values, collectively valuing what researchers hope to achieve and find, which makes a shared value system within a research community [52].

Research on the fit between strategy and IS models positions the research problem to the IS context. Vaishnavi and Kuechler name IS a *multi-paradigmatic community* [51], where different sets of practice define IS as a scientific discipline and researchers can take different stands following different paths when investigating IS research problems. Table 1 presents the dominant research paradigms within IS with respect to their philosophical assumptions.

Table 1. Dominant IS research paradigms

Paradigm	***Philosophical Assumptions***
Positivism [42]	**Ontology:** suggests that there exists a single reality regardless of people and their experiences. **Epistemology:** phenomena observed in the world can be explained through cause-effect relationships and are expected to embed explanation, prediction and control. Scientific knowledge allows for verification or falsification and the strive for generalizable results. **Methodology:** entails quantitative approaches aimed at providing objective and bias free knowledge. **Axiology:** entails striving for a universal truth supporting prediction of phenomena.
Interpretivism [42]	**Ontology:** argues that reality is constructed by people and their (inter)actions thus phenomena observed are dependent on their context along with people's subjectivity and through social interaction. **Epistemology:** truth is subjective with knowledge emerging from the active participation of the researcher in the phenomena investigated (social interaction). **Methodology:** qualitative approaches reinforce a participatory investigation of phenomena by engaging researchers in the social environment examined. **Axiology:** entails striving for understanding and describing including subjectivity acknowledgments affecting validity of results.
Social Constructivism [9]	**Ontology:** suggests that reality lies within the world people live and work, where subjective meanings of their experiences are developed. **Epistemology:** meanings are formed through interactions between people based on as many observers'/participants' views as possible of a situation examined, as well as through pre-existing norms and views. **Methodology:** entails participatory approaches to construct the meaning of a situation examined through social interaction, Focus is put on specific contexts where people operate to understand their historical and cultural settings. **Axiology:** focuses on making sense of meanings others have on a situation examined along with the researcher's own interpretation due to their background and experiences.
Pragmatism [9]	**Ontology:** suggests that truth is not bounded by any particular worldview or philosophy, rather what works for the situation examined. **Epistemology:** knowledge is gained based on examining the "what" and "how" with respect to the intended effects. **Methodology:** entails freedom of choice for multiple and mixed methods and techniques rather than subscribing to one, based on the needs of a situation examined. **Axiology:** suggests making sense of what works at the time and that is the truth.

Critical Realism [7]	**Ontology:** suggests the real world exists independently of our knowledge, beliefs, thoughts, perceptions etc. whether observable or not. **Epistemology:** knowledge is considered social and historical, where not all viewpoints must be equally valid, and exists in different types; physical, social, and conceptual. **Methodology:** entails a range of different research methods due to the different knowledge types and supports a mixed-methods research. **Axiology:** knowledge of reality is a result of social conditioning and, thus, cannot be understood independently of the social actors involved in the knowledge derivation process.

However, the emergence of DSR as a scientific study within IS has also emerged the idea of design science as a research paradigm [23, 52], though not widely accepted to cause a paradigm shift [30]. Nevertheless, for DSR, IS research paradigms can be combined in the same design science project, for example positivism and interpretivism [26].

This diverse utilization of research paradigms within design science is closer to the idea of a multi-methodological approach to IS research [41] or what is commonly refereed to as *pluralism*, which suggests that mixed method research designs are preferable to encompass real setting, social situations and research context [36]. Therefore, research paradigms with different philosophical assumptions can be utilized during each step of the research process influencing the selection of research methods employed [52, 26]. Particularly, ontological and epistemological views shift as a design science project progresses [52].

In the scope of this work, during the early steps of the research process the social constructivism perspective is relevant as it provides multiple reality experiences from multiple organization settings for the alignment linkage between business strategy and IS influencing both the practical implications of the problem as well as requirements put on the unified business strategy meta-model to be build. Moreover during the later steps of the process the positivist perspective becomes relevant as the unified business strategy meta-model becomes more stable and thus it is through observation that predictions can be made on the satisfaction of the requirements put on the artifact, which may lead to additional iterations of the design cycle. The pluralistic research paradigm followed in the development of UBSMM in the context of the alignment linkage between business strategy and IS is summarized in table 2 with respect to the philosophical groundings of *design science research* [52], influenced by [24].

Ontologically, design science research suggests that the state of reality is altered through the introduction of artifacts. However, there exists one single, stable underlying physical world whose laws constraint the various altered reality states during the artifacts' development. Epistemologically, knowledge is produced through the process of constructing and employing artifacts. Information on the artifact, its comprising components and their interactions, is considered true when artifacts behave as expected. Therefore, meanings are the utility provided and the functionality enabled with respect to the problem being addressed. Methodological concerns entail incremental artifact development and assessment

with respect to the setting investigated. Axiologically, apart from the truth, researchers value control and creative adjustment of the setting investigated for the end result contributes to the body of knowledge with practical solutions or even partial and incomplete theories paving the way for further investigations.

Table 2. Business Strategy Modeling following a DSR paradigm

Basic Belief	*DSR [52]*	*Applied in UBSMM*
Ontology	Multiple, contextually situated alternative world-states. Socio-technologically enabled	Reality evolves as the alignment linkage is dependent on multiple alternative organizational settings as each organization is unique
Epistemology	*Knowing through making*: objectively constrained construction within a context. Iterative circumscription reveals meaning.	Knowing through making via iterative applications of the model-driven proposal revealing findings, which consequently lead into fine tuning of the proposal itself
Methodology	Developmental. Measure artifact impact on the composite system.	Reasoning through the design cycle actualizes the model-driven proposal for the alignment linkage in the development of a unified business strategy meta-model, whose impacts are assessed
Axiology	Control; creation progress (i.e. improvement); understanding.	Conceiving, incrementally creating and understanding the applicability of the unified business strategy meta-model in the context of the alignment linkage along with any socio-technological implications identified, constitutes valuable contribution

4 Business Strategy Modeling Using the Design Science Method

The scientific study and creation of artifacts in design science evolves iteratively and incrementally into a practical solution, through a generic design cycle [23]. Furthermore, the essential activities constituting a design science research project include: *explicating the problem; outlining the artifact and defining its design requirements; designing and developing the artifact; demonstrating; evaluating; and communicating the artifact* [23, 51, 22]. In our study we have adopted Johannesson and Perjons' *Design Science Method* (DSM) [26], which is a holistic problem solving approach through artifact development (Figure 2).

The DSM consists of an activity flow presented using IDEF0 (Figure 2), which is enriched with the research methods (upper part) and the knowledge base used

for each activity (lower part). Therefore, for each activity, there exists some input which is transformed to some output using the knowledge base with respect to research methods. Similarly to the activities of other design research approaches [43, 51, 22], the activity flow of DSM is not temporal, rather it is based on input/output relationships between activities [26].

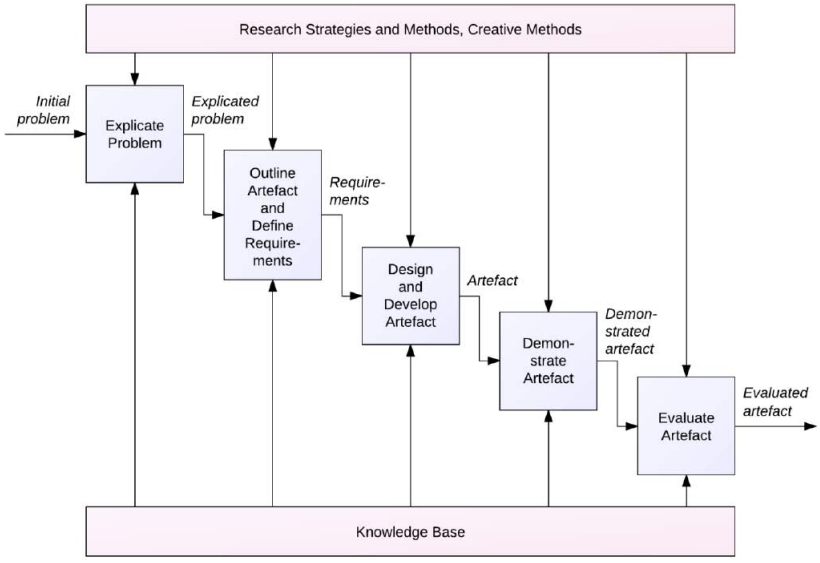

Fig. 2. The Design Science Method (adopted from [26])

4.1 Explicate Problem

The problem has been explicated through document studies as presented in section 2 as well as in [11–13, 10, 18] showing that business strategy is abstractly used when it comes to the linkage between strategic initiatives and IT solutions hindering alignment of the *Business* with *IT*. Resources used included literature addressing the overall problem of alignment, proposals addressing the alignment linkage and literature on types of IS models used.

In addition, an empirical study in the form of a self-administered online questionnaire targeting both business and IS practitioners has also been used to strengthen the problem identified and with an empirical basis [19, 17].

4.2 Outline Artifact and Define Requirements

The artifact is a unified business strategy meta-model (UBSMM) that integrates conceptualizations of business strategy formulations that can be mapped to IS models. It has been outlined based on literature and document studies of business strategy formulations reported in [11–13, 10, 15, 18, 16, 20], but also through theoretical analysis of usage scenarios for UBSMM [11, 18], through the aforementioned empirical study reporting on the use and acceptance of particular

business strategy formulations as well as on the wide acceptance of different IS models by practitioners [19, 17]. These are presented as artifact requirements for UBSMM in Table 3 (Req. 1, Req. 2, Req. 5, and Req. 6).

Regarding model quality criteria, there exist varying perspectives (i.e. theory-based, experience-based, observation-based, consensus-based, and synthetical) resulting into many approaches, though no standard or consensus seems to exist as summarized in [39]. The selection of quality criteria has been based on the essential requirements of model correctness (Req. 4 in Table 3) and model completeness (Req. 3 in Table 3), as there exists empirical evidence suggesting they are the most influential factors of model quality for practitioners [40]. Document studies on schemata integration [4, 5] have also been used [18, 20].

Table 3. Artifact requirements for UBSMM

Req. 1	The business strategy formulations chosen to build UBSMM shall enable comprehensive coverage of business strategy with respect to Barney's types of strategy logic [3]; this will allow UBSMM to be linked with IS offering a comprehensive view on business strategy.
Req. 2	The integration of business strategy formulations shall follow a systematic process; this will allow for further enrichment and evolution of UBSMM to integrate emergent business strategy formulations in the future.
Req. 3	UBSMM shall be complete; this corresponds to model completeness with respect to the conceptualizations of business strategy formulations [32, 5, 48, 40], understandability [5, 40] and language adequacy [48].
Req. 4	UBSMM shall be correct; this corresponds to model correctness [5, 40], model validity [32], and model construction adequacy [48].
Req. 5	Each of the business strategy formulations integrated shall be derivable from UBSMM, which shall result into a conceptualization for each business strategy formulation in the form of a conceptual model; this allows for specializing UBSMM to conceptualizations for each business strategy formulation integrated, which consequently will allow instantiating the conceptualization into the business strategy of an organization.
Req. 6	Conceptualizations derived from UBSMM shall be mappable to IS models (i.e. RE, EM, and EA approaches), thus allow traceability of business strategy notions (objectives, intentions, etc.) to IS.

4.3 Design and Develop Artifact

Designing the artifact has been based on literature and document studies of the business strategy formulations that have been analyzed while outlining the artifact. Practical industrial applications of these formulations have also been considered. Conceptualizations for each business strategy formulation have been build using UML class diagrams. Moreover, literature in conceptual modeling and schemata integration has been used to define a development process for the artifact. The development process of UBSMM entails distinct phases that include from selecting business strategy formulations and building their conceptualizations to

their integration into UBSMM. Based on the foundational work of [4] and [5] the four phases adopted are:

1. *Pre-Integration*; schemata to be integrated are selected and an integration strategy is decided.
2. *Schemata Comparison*; schemata are analyzed and compared for correspondences, conflicts and inter-schema properties.
3. *Schemata Conformance*; resolutions for conflicts are defined and modeling decisions are made upon correspondences and inter-schema-properties.
4. *Schemata Merging and Restructuring*; conflict resolutions are applied along with restructuring resulting into one schema.

During pre-integration, business strategy formulation schemata were selected, their conceptualizations were built as UML class diagrams, accompanied with constraints [12, 13, 16]. Following a binary strategy for the integration process, which allows for progressive and gradual unification of business strategy formulations [4, 5], UBSMM was built in two steps. The first step included integration of meta-models for SMBSC and VC, where all succeeding phases of the integration process were carried out resulting into a first version of UBSMM as presented in [18]. In a similar manner, the second step included integration of the derived first UBSMM version and the BOS meta-model, also following the succeeding phases of the integration process as discussed in [20]. This order of preference was based on literature indicating SMBSC and VC are well-established [10], also supported by results of empirical studies [19, 17].

For both steps, schemata were analyzed and compared to identify correspondences between concepts across business strategy formulations, naming conflicts and structural conflicts, as well as inter-schema properties [4, 5]. During schemata conformance, semantic relationships between concepts were identified with respect to conflicts, correspondences and inter-schema properties and resolutions were decided (i.e identical, equivalent, compatible and incompatible[4]). Finally, during the last phase, the conformed schemata were merged and restructuring occurred to accommodate conformance of resolutions into one schema.

The implementation of all phases is presented in [18] for SMBSC and VC resulting into a first version of UBSMM and again in [20] for the integration of BOS, which resulted into a complete UBSMM.

4.4 Demonstrate Artifact

Once developed, artifacts are used in instances of the problem they have been built to address [43]. Therefore, each business strategy formulation integrated to UBSMM has been demonstrated through experimentation, which included instantiating their conceptualizations using real world published applications. This entailed using the meta-models built for each business strategy formulations and a strategy from real published cases, as well as mappings to IS models used for system requirements.

For the former, the strategy map template, the value shop, and the strategy canvas have been used along with the original publications of the formulations [27], [49], and [28] respectively, which have been reported in [12], [13], and [16].

For the latter, mappings for the conceptualizations of Strategy Maps and Balanced Scorecards and Blue Ocean Strategy towards i* have been instantiated, which allowed the derivation of i* models from business strategy [15].

Experimentation with the aforementioned applications demonstrated that UBSMM integrated business strategy formulations reducing the risk of incorporating variances due to misinterpretation and also allowed for their mapping IS models such as i* which is used in requirements engineering.

4.5 Evaluate Artifact

UBSMM has been evaluated with respect to the requirements defined in section 4.2, as summarized in table 4. For *Req. 1* and *5* theoretical analysis has been used to build informed arguments for their satisfaction. For *Req. 3* and *4* experiments have been used to report on their satisfaction. Whereas for *Req. 2* and *6*, both experiments and theoretical analysis have been used.

Table 4. Requirements evaluation for UBSMM

Req. 1	Business strategy literature from strategic management has been analyzed and informed arguments have been built for using SMBSC, VC, and BOS. The reasoning that supports this argument is based on the construction of the artifact [26]. UBSMM has been constructed based on the conceptualizations of business strategy formulations that are representative of the three types of strategy shaping logic suggested in [3]. Thus, providing comprehensive coverage of business strategy notions [11, 18, 20, 17].
Req. 2	The schema integration process adopted is well-documented and allows the continuous and integral integration of more business strategy formulations to UBSMM in a systematic manner [18, 20].
Req.3&4	Experiments using real-world published cases have been conducted; ABB Industrie AG for SMBSC [12], the Norwegian police for VC[13], and Southwest Airlines for BOS[16]. Additional experiments have been conducted for SMBSC involving the real strategy map for education in a Swedish higher education institute [14], as well as the use of the SMBSC meta-model to capture consumer values for a shopping mall [50]. Concepts from the original business strategy formulations have been modeled and instantiated using the aforementioned cases. For SMBSC and VC, the meta-models have been implemented in semantic languages such as OWL creating instances with respect to the cases modeled but also to allow for formal evaluation of concepts and associations modeled. Model constraints were also formalized and model constructs were instantiated one by one.
Req. 5	Constraints defined for UBSMM allowed to derive conceptualizations of each of the three integrated business strategy formulations in the form of a conceptual models [20].
Req. 6	Experiments have been used for mappings to IS models used towards RE [15, 14], while informed arguments have been built for mappings to IS models towards EA [18] and EM [20].

Overall, with respect to generic DSR criteria: validity, utility, quality and efficacy [23, 21], experiments have shown that UBSMM functions as intended; it captures business strategy for each of the three business strategy formulations integrated and can be conceptually related to RE, EA, and EM approaches through mappings. In terms of utility, the experimental application of UBSMM in [15, 50, 14] has shown how to establish a bidirectional linkage between business strategy and the IS requirements' model derived. In terms of quality, UBSMM has fulfilled requirements on completeness and correctness (Req. 3 and 4) but it has also shown ease of understanding through the experiment in [14], which is relevant to pragmatic quality in [29]. The idea of using such models for establishing and strengthening the alignment linkage has been positively received by practitioners [19, 17], which is indicative of the approach' efficacy.

5 Discussion

The foundation of the adopted DSR paradigm has been used to guide the production and communication of a new knowledge artifact that is relevant for a global practice. Creation of generalizable knowledge has further required the use of rigorous research strategies and methods along the research process. As very important, the applied Design Science Method does not prescribe a sequential way of working. The activities (see Figure 2) are logical and not temporal groupings of work, i.d. as explained in section 4. The relationships between activities are solely of the input-output type, hence, the development process is iterative, capable of absorbing complex and changing requirements for the artifact, both directly as well as through changing environment. Moreover,the DSM implemented in this work is consistent with characteristics of both the artifact and process of other DSR strategies, as in [25].

During the research process multifold uses of UBSMM have emerged: a) iterative integration of the conceptualizations of existing and future strategy formulations to facilitate formal mappings to IS models, b) a reference model to synchronize or integrate business strategies across business of an organization, or of the partners in a multi-organizational constellation; c) a single point for mapping to IS models practiced across various business units/organizations; d) a pivot model for organizations to assess their business strategy considering a different type of strategy-shaping logic (resource-based, competition-based, innovation-based), or to explore potential strategic shifts, for example from resource- to innovation-based considering implications on IS.

As for limitations of the used research paradigm and the process, an obvious one is a lack of the techniques and the tools to support development of the artifact as it is the case with system development tools. Another limitation concerns the extent of evaluation of the artifact DSR does not offer prescriptions on how to evaluate artifacts differentiating in terms of their scope, adoption time, way, duration and change of use, etc. Hence the evaluation of UBSMM is currently limited, as indicated in section 4.

6 Concluding Remarks

In this study we have presented the application of the DSR paradigm followed for modeling business strategy in the development of the Unified Business Strategy Meta-model (UBSMM). Within the scope of our proposal the selection of the DSR paradigm was motivated with respect to the philosophical assumptions underpinning business strategy modeling and the need for a pluralistic paradigm.

The outcome of our work can serve as prescriptive knowledge for future business strategy modeling efforts. It puts forward a set of requirements for business strategy modeling addressing domain coverage (Req.1 and 5), progressive evolution through integration (Req. 2), model quality (Req. 3 and 4), and linkage to IS (Req. 6).

At the same time, the design science perspective followed and applied contributes to the body of knowledge with a set of paradigmatic research assumptions for business strategy modeling including ontological, epistemological, methodological and axiological assumptions. Such differences in research assumptions influence a series of concerns that frame the research agenda: what is it to be observed, what questions shall be asked around the problem and how, what methods should be selected and how should they be applied, what kind of results should be expected, how should these be analyzed and interpreted.

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