

Sustained Competitive Advantage Using Business Entities (SCUBE): A Practical Approach for Business Agility

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Abstract Enterprises competing in today's highly dynamic business environment aim at achieving Sustained Competitive Advantage (SCA) as defined by Barney. In this paper, we present an operational method and the protocol for its application for realizing SCA through Business Entity analysis. Business entity-centric modeling has been a successful approach in rethinking and revolutionizing business operations, in a number of engagements. Our method provides a path from SCA-generating strategies to Business Operations and Business Entities. Our approach leverages key constructs from OMG's Business Motivation Model (BMM) and emphasizes the analysis of Influencers – factors that have the capability to impact an enterprise's strategies that generate SCA. Further, these strategies are used to formulate Business Operations that can be defined by Business Entities. IT applications can be generated from the Business Entities using Model-Driven Architecture. Therefore, these discovered Business Entities actually provide a valid scope for innovating Business Operations and developing IT applications that result in SCA for the business.

1 Introduction

Now, more than ever, within the current economical crisis, it is imperative that businesses adapt effectively to the changing environment. Towards this end businesses need to innovate strategically to achieve *sustained competitive advantage* (SCA) [1]. A firm is said to have SCA when its competitors cannot imitate its

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core strategy or are unable to duplicate the benefits of the strategy. Therefore, it is critical to develop the right business strategies to revolutionize business operations, and to implement appropriate IT systems to support the operations.

While identifying which strategies can generate SCA is one issue, another issue is to design business operations and IT systems which can be well aligned with the strategies.

Model-Driven Business Transformation (MDBT) [5, 6] extends MDA [9] by replacing the computation-independent model by a Strategy Model and an Operation Model. To ensure a successful top-down transformation, the Strategy Model captures business goals and the Operation Model describes business operations for achieving the goals. A business artifact-centric approach is a business-friendly technique for modeling Business Operations [2, 7].

We provide a methodology that unifies the SCA approach with the business-artifact approach to span the distance from strategy formulation to the realization of business operations and thus enables a company to adapt its business and its operation to rapidly changing environments. This method leverages constructs that have been standardized by the Object Management Group in its Business Motivation Model (BMM) [8].

In this paper, we extend from our previous work to provide practical guidelines for implementing the methodology. Towards this end we will focus on protocols that enable practitioners to execute the essential steps in the method. The remainder of the paper is organized as follows. In Sect. 2 we provide a brief account of Business Motivation Model, the concepts of Sustained Competitive Advantage, and the Resource Based View of the firm theory. In Sect. 3 we describe the proposed method along with protocol (or practice) notes. We conclude with a brief description of our future research.

2 Theoretical Background

2.1 *Business Motivation Model (BMM)*

The Business Motivation Model [8] is a standard adopted by the Object Management Group (OMG) in 2005, and the current version (1.1) was published in May, 2010. The BMM is a structure for developing, communicating, and managing business plans. It encompasses top-level strategic concepts such as Goals, Objectives, and Resources, but its scope ends at the boundary with Business Operations. Furthermore, the BMM has a formal meta-model that includes a vocabulary and a catalog of concept definitions.

The overall meta-model is organized into two related hierarchies that are rooted in Means and End respectively. Means is anything that may be called upon, activated, or enforced to achieve Ends. Desired Result, which is a target that an enterprise intends to maintain or sustain, is a specialization of End. There are two types of Desired Result: *Goal* and *Objective*. A Goal is a state to be brought

about by appropriate means. An Objective is a specific time-targeted, measurable, attainable target that an enterprise seeks to meet. An Objective quantifies a Goal.

A Course of Action, is defined as a plan for configuring some aspect of an enterprise undertaken to achieve ends, is a specialization of Means. Of the types of Courses of Action, the most significant here is *Strategy*, which is an element of a plan devised through the science and art of business leadership exercised to ensure the most advantageous conditions [8].

The next relevant element in the BMM is *Influencer*. An Influencer is neutral but has the capability to impact the enterprise in its employment of Means or achievement of its Ends [8]. Specifically, an Influencer can affect the Strategy of an enterprise. Influencers can be *Internal* or *External* depending on whether they are inside or outside the enterprise. Competitor, Customer, Regulation, Partner, Environment and Technology are categories of *External Influencers*. Corporate Value, Infrastructure, Assumption, Habit, Issue, Management Prerogative and Resource are categories of *Internal Influencer*. According to BMM [8] “An Influencer is something that can cause changes that affect the enterprise in its employment of its Means or achievement of its Ends” implies a direct relationship between Influencer and the Means of achieving Ends. This implies the relationship that an Influencer can affect a Course of Action. To summarize the relevant relationships we will use from the BMM, *an Influencer can affect the Strategy that an enterprise uses to channel its efforts toward the achievement of its Goals and Objectives*.

2.2 Sustained Competitive Advantage (SCA) and Resource Based View

The Resource Based View of the firm theory (RBV or RBT) [1] proposed by Barney in 1991 has the objective to understand how a company can achieve a *Sustained Competitive Advantage* (SCA) by implementing strategies that exploit internal strengths, through responding to environmental opportunities, while neutralizing internal threats and avoiding internal weaknesses. SCA can be achieved through *firm resources*. This view brings out two important concepts, SCA and firm resources. *A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy* [1]. In this view, firm resources are defined as “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of or implement strategies that improve its efficiency and effectiveness”, and a firm resource that has the potential to provide SCA must have the following four characteristics:

- *Valuable* – enabling a firm to conceive of or implement strategies that improve its efficiency and effectiveness,

- *Rare* – not possessed by a large number of competitors or potential competitors,
- *Imperfectly imitable* – cannot be obtained by firms that do not possess it, and
- *Not substitutable* – there are no strategically equivalent resources that are themselves not rare or imitable.

Aware of the broad discussion among scholars about the concepts of *resource* and *capability*, we referred to Barney's definition of resource, which includes the concept of capability. *Capabilities* refer to an organization's ability to assemble, integrate, and deploy valued resources, usually, in combination or co-presence [11]. Firms create competitive advantage by assembling resources that work together to create organizational capabilities, also Penrose [10] sustain that firms can create economic value not due to mere possession of resources, but due to effective and innovative management of *resources*. On the definition of SCA, apart from some discussions about the sustainability and duration of the competitive advantage [12] there is a good level of agreement among scholars. Motivated by RBV, in this paper, we propose a new methodology to investigate the sources of SCA. Following the definition of SCA which really emphasizes strategies, in this paper, we examine two specific aspects of strategies for the source of SCA: (1) specific internal or external factors that have the capability to impact strategies of an enterprise, and (2) business behaviors that realize strategies. The first aspect corresponds to Influencers in BMM. Inspired by the analysis of firm resources, we also examine if an Influencer has the same characteristics to determine its potential to generate SCA through strategies. The second aspect is referred to as business operations. Since the business entity approach has been used effectively for modeling business operations [2, 3], we indirectly create the linkage between SCA and business entities. Accordingly, an enterprise can use business entities as a vehicle for revolutionizing operations and developing supporting IT applications. Therefore, different from conceptual analysis of firm resources as the source of SCA, our proposal aims to provide an actionable method to help enterprises choose the strategies that generate SCA. This method provides practical guidance being made up of a set of formalized steps. In the attempt to fill in the gap between the exposition of a theory of Strategic Management as the RBV is, and the pragmatism of the models used by software engineers (of which BMM is a typical expression). A methodology with this characteristic represents an original contribution to both the Strategic Management and the Software Engineering field.

3 Methodology: Sustained Competitive Advantage Using Business Entities (SCUBE)

In this section, we describe our methodology for choosing strategies that generate SCA (i.e. *SCA-generating Strategies*) through analyzing Influencers and then business operations and Business Entities that realize these strategies. We illustrate the methodology, called "*Sustained Competitive Advantage Using Business*

Entities” (SCUBE) and we explicitly detail the research protocol for the applicability illustrating the roles involved and the question that need to be asked in each of the steps. It should be noted that we do not suggest that automation of this method is feasible, as most steps require deep business knowledge.

3.1 Methodology: SCA Using Business Entities (SCUBE)

- Input:** Defined Desired Results, Strategies that channel efforts towards the achievement of the Desired Result, and Influencers using the adapted BMM model
- Output:** Business Operations responsible for SCA and Business Entities produced by these Operations
- Step 1:** Examine if an Influencer or a combination of Influencers is valuable, rare, imperfectly imitable, and not substitutable. Select the Influencers that satisfy these properties.
- Step 2:** Describe Strategies that are impacted by the Influencers selected in Step 1. These are SCA-generating strategies.
- Step 3:** Identify Goals that are achieved by these SCA-generating Strategies.
- Step 4:** Identify Objectives which quantify each of the Goals.
- Step 5:** Identify Operations that achieve these Objectives
- Step 6:** Identify Business Entities produced by these Operations. Thus, these Business Entities can lead to SCA.

The **input** to our proposed methodology is Desired Results (Goals and Objectives), Strategies, and Influencers specified following the adapted BMM model. Traditional methods, for example, Balanced Scorecard [4] can be used to help an enterprise define Goals and Strategies to achieve these Desired Results. Identifying all the inputs for SCUBE application is probably the activity which requires the greatest effort: for this purpose it is necessary to interview an executive or top manager and collect all the material available including documents and power point presentation about how a company makes business. Firstly it's necessary to discover Desired Results of a company (a Desired Result is an End that is a state or target that the enterprise intends to maintain or sustain) by asking the interviewee questions such as “*What is your Vision?*” and “*What is the target state you want to reach?*”. Secondly it's necessary to point out the Courses of Action of the company, which include Strategies and Tactics, it represents the basic elements of a general plan or overall solution; in other words, an overall approach that the enterprise will take to achieve its Desired Results. In particular we decided to focus on an accurate identification of strategies and the key questions to be asked are “*What are the strategies you think are able to realize the Desired results just identified?*” and “*What actions are you putting in place to reach your mission?*”. Eventually to complete the input definition the most time consuming and committing part is surely related with the identification of all the Influencers, intended as described

in the BMM model. This stage is critical because we need to make all the External and Internal Influencers explicit and we need to be sure to share with the interviewee the same definitions for all the Influencers, thus for some internal Influencers such as Management Prerogative, Assumptions or Resource we provide the interviewee the BMM definitions along with examples developed by our research team belonging to another company. The identification of the Input for SCUBE, viz. Desired Results, Strategies and Influencers concludes the first part of the interview. Before starting with the second round of interviewee, that would deal with the real application of SCUBE, the research team should perform an analysis of which influencers or combination of influencers would possibly be considered of sources of SCA and would like to test against the four characteristics of SCA. That means to perform a preliminary selection of those influencers or combinations of Influencers and exclude those one which clearly would fail in one of the four tests.

Step 1 is the first stage of the second round of interview and consists of testing the preliminary selected influencers against the four attributes of SCA, parameterized with accurate questions. Within this step the research team need to challenge the executive and make her prove the value of the influencer by demonstrating its ability to enhance the quality of the service (or product) provided by the company. Subsequently we need to verify rareness: in this case the task is mainly performed by the research team that must verify whether competitors or not possess this Influencer, the opinion of the interviewee has to be taken in consideration by might be biased by her position. Then it comes the test against non-substitutability: also for this test is absolutely necessary that the research team verifies if in other companies the same strategy is realized by a different Influencer or not and moreover the questions to ask the interviewee is *“Does a one-to-one correspondence between an influencer (or combination) and a particular strategy exist?”*. Eventually regarding non-imitability the idea is to explore if the Influencer cannot be imitable by competitors due to historical reasons, causal ambiguity or social complexity, therefore the questions to be asked the interviewee are *“Is the considered influencer (or combination) directly dependent on a socially complex phenomenon?”*, *“Does the company know how the influencer (or combination) generates a SCA or this link is tacit and implicit?”* and *“Is the influencer directly dependent on some particular historical reason?”*. Influencers or combinations successfully responded to these for criteria are selected for Step 2.

Step 2 requires a deep commitment from the executive interviewee: it's necessary she describes in details the strategies on which the selected Influencers have their impact, what kind of impact they have and how that strategy can be linked to a Sustainable Competitive Advantage for the company.

Step 3–6 should be less critical and more straightforward: in Step 3 the interviewee has to answer the question *“Which are the goals that can be achieved by the selected SCA-generating strategies, and what's their relation with the company's vision?”*

Step 4 requires the presence of a manager that has a clear visibility on the target that the specific processes of a company has to reach. He is asked to translate the

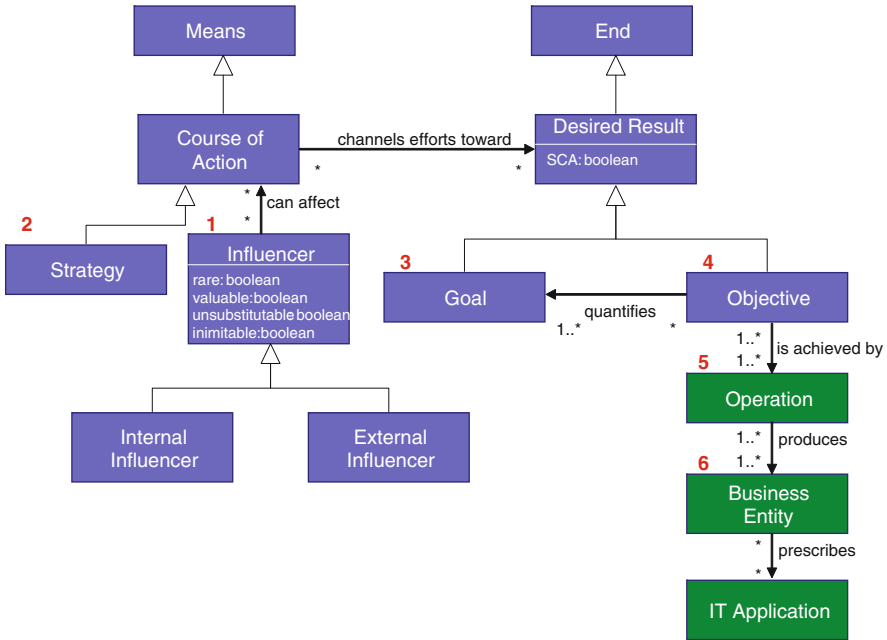


Fig. 1 Modified BMM class diagram with SCUBE methodology

goals explicated by the executives in specific objectives containing a measure and a target value for that measure.

Step 5 involves always a managerial or operative role, he's asked to identify all the operations that concur to the achievement of the specific objective, in particular he has to answer the question "*Which are the processes, information, roles and systems that contribute to the realization of the specific objective?*"

Step 6 finally should come very straightforward: the research team should be able to define from Step 5 which are the Business Entities are involved in each operation and subsequently responsible for SCA.

Figure 1 shows the main steps of the SCUBE methodology. This figure extends from BMM model by adding additional elements, SCA, Operation, and Business Entity.

4 Conclusion and Future Work

In this paper we propose a new methodology for achieving Sustained Competitive Advantage synthesizing and evolving concepts from Resource Based View of the firm, Business Motivation Model and MDBT. We illustrate the protocol for the application of the methodology that is currently being tested in real engagements.

We have a body of evidence that the MDBT framework and thinking has resulted in improving the operations of businesses significantly. The SCUBE

method described here provides the formal linkage to strategy that has been lacking in MDBT; the expected pay-off of course is business agility. A remarkable aspect of the proposed methodology is that it is very concrete in the sense that we propose a practical way that would allow any company to achieve business agility with a set of formalized steps. None of the other paradigms or models mentioned within the paper possesses this characteristic, as BMM is in fact just a model of a company's business and SCA is a principle that drove our work. Our method, properly integrated with MDBT can practically help organization in developing business solutions from strategy; development of business solutions from technological innovation is not the focus of our method.

We are aware that the methodology we proposed has some limits and needs to be tested in real applications. A first issue to investigate is the applicability domain of the SCUBE methodology. Moreover, the methodology should include a definition of a performance measurement system. A monitoring system should be put in place to provide executives with up-to-date information about the strategic impact of the initiatives performed on the business entities and the software applications that support them. This final stage of the methodology has not been defined yet.

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