Strategy-focused and value-oriented capabilities: methodology for linking capabilities with goals and measures

Dmitry Kudryavtsev[1,2], Lev Grigoriev[1], Svyatoslav Bobrikov[1]

[1] Business Engineering Group, Furazhnyj, 3,
191015 Saint-Petersburg, Russia
[2] St. Petersburg State Polytechnical University, Polytechnicheskaya, 29,
195251, St.Petersburg,

{dmitry.ku, griglev, svyatoslav.bobrikov}@gmail.com

Abstract. Capability-based enterprise modeling is gaining presence in business practice. Capability is the central concept of the resource-based view of a firm, and it helps to bridge strategy with business operations. The use of capabilities for behavior modeling provides flexibility, stimulates reuse, and helps the firm to focus on its core competencies. In order to benefit from this approach, capabilities must be strategy-focused and value-oriented. In other words, strategic goals and measures must be linked to capabilities. The paper provides a methodology to solve this task, which integrates a set of principles (way of thinking), a step-by-step method (way of working), viewpoints, and a meta-model (way of modeling). The article also points to the enterprise architecture management tool, which supports the suggested methodology.

Keywords: enterprise modeling, strategy, goals, capability map, strategy map, strategic alignment, goal cascading matrices.

1 Introduction

The primary pursuit of business is creating and maintaining value. The resource-based view suggests that firms' resources drive value creation via the development of competitive advantage [1]. Specifically, the resource-based view suggests that possessing valuable and rare resources provides the basis for value creation. This value may be sustainable when those resources are also inimitable and lack substitutes [2]. However, merely possessing such resources does not guarantee the development of competitive advantages or the creation of value. To *realize* value creation, firms must accumulate, combine, and exploit resources. Prahalad and Hamel outline that the source of competitive advantage is to be found in the management's ability to identify the core competencies of a firm, i.e. "consolidate corporate-wide technologies and production skills into competencies that empower individual businesses to adapt quickly to changing opportunities" [3]. As work on the resource-based view has

progressed, it has become clear that the resource-based view extends not only to the assets of an organization, but also to its capabilities. *Capability is the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result* [4].

From the theories of the resource- and competence-based view, a capability-based modeling paradigm was derived [5; 6; 7; 8]. By making the firm's capabilities and their connections visible and providing corresponding performance measures, the capability map concept helps to capture the firm's capabilities structure and to solve related problems of reengineering and outsourcing, e.g. using "heat maps". Capability modeling provides guidance on determining how changes in particular business areas, or outsourcing particular business functions, will affect the overall business and not only a singular business process. The use of capabilities for behavior modeling provides flexibility, stimulates reuse, and helps the firm to focus on its core competencies.

Since capabilities bridge strategy with business operations and information technologies, they must be linked with strategic goals [9]. In order to support value orientation, it is necessary to clarify this concept. Iacob et al [9] identified that value definitions vary from soft/qualitative to formal/quantitative: as objective functions, (economic) indices. Some value taxonomies/frameworks are mentioned: e.g., Deloitte enterprise value map [10]. It seems that the concept of value is very much related to performance, since performance measures (i.e., so-called key performance indicators) are also value measures, (e.g., costs, profit, customer satisfaction, etc.) [11; 12]. So if capabilities will be associated with the corresponding performance indicators, which measure values of different stakeholders, it will be possible to consider such capabilities to be value-oriented.

There exist some frameworks, methods, and models for linking capabilities with strategic goals and measures, such as Hafeez et al framework for determining key capabilities [13], Kaplan and Norton methodology [14, 15] and Archimate capability extension [16]. However, there is a lack of the integrated model-driven methodology. Modelling and automated support is crucial for a design methodology. According to [17] "a design methodology is characterized by a way of thinking, controlling, working, and modelling. Preferably, these "ways" are supported by a coherent set of automated tools (a designers' environment or workbench)." So the objective of the current paper is to provide an integrated methodology for linking capabilities with strategic goals and measures, which will include a set of principles (way of thinking), a step-by-step method (way of working), viewpoints, and a meta-model (way of modeling).

2 Principles for linking capabilities with goals and measures (Way of thinking)

The first principle: goal cascading follows the structure of the capability maps (or more generally, behaviour structure). On one hand, it applies to the translation of goals between levels of strategy (corporate, business and functional), which follows

the hierarchy of corporate, business and functional systems (of behavior), see [18]. On the other hand, it applies to goal cascading within one strategy level. Norton and Kaplan identified four perspectives (or groups) of strategic goals: Financial, Customer, Internal and Learning&Growth [14; 19]. While the Financial and Customer goals have its own decomposition logic, the Internal and Learning&Growth goals follow the structure of the capability map.

The second principle: two dimensions for capability decomposition. This principle is inspired by the work of Malone and his colleagues [20]. Although their work was devoted to processes, its generality enables to apply that approach to behavior in general and capabilities in particular. They claim: "Most process mapping techniques analyze business processes using only one primary dimension: breaking a process into its different parts. Our representation adds a second dimension: differentiating a process into its different types". Table 1 illustrates the difference between these two dimensions. In this table, the generic activity called "Sell" is broken apart into parts (or subactivities) like "Identify potential customers" and "Inform potential customers." The generic activity is also differentiated into types (or specializations) like "Sell via store" and "Sell via face-to-face sales".

Table 1. Example 2-dimensional decomposition of the "Selling" activity

<table>
<tr><th colspan="7">Types of Selling</th></tr>
<tr><td colspan="3">Sell what?
• Sell process
• Sell service
• Sell product
Sell to whom?
• Sell to businesses
• Sell to consumers</td><td colspan="4">Sell how?
• Sell via store
• Sell via face-to-face sales
• Sell via other direct marketing
Sell via what channel?
• Sell direct
• Sell via broker
• Sell via distributor</td></tr>
<tr><th colspan="7">Components (Parts) of Selling</th></tr>
<tr><td>Identify potential customers</td><td>Identify potential customers' needs</td><td>Inform potential customers</td><td>Obtain order</td><td>Deliver product or service</td><td>Receive payment</td><td>Manage customer relationships</td></tr>
</table>

Malone and his colleagues add "we have found it useful to combine specializations into what we call "bundles" of related alternatives. These bundles do not have a direct parallel in traditional object-oriented languages; however, they are comparable to "facets" in information science [21]. For instance, Table 1 shows part of the specialization hierarchy for sales processes. In this example, one bundle of specializations for "Sell something" is related to *how* the sale is made: direct mail, retail storefront, or direct sales force. Another bundle of specializations has to do with *what* is being sold: beer, automotive components, financial services, etc. Comparing alternative specializations in terms of their ratings on various criteria is usually meaningful only *within* a bundle of related alternatives".

We applied this decomposition concept to capabilities and received the “Capability type” as a result of specification and the “Capability component” as a result of breaking “Component” down into parts, see Fig. 1. “Capability component” becomes a capability of the next hierarchy level. Besides we use the concept “Capability value configuration” (adapted from [22, 23]), which realizes the “Capability type” and is based on the “Capability components”.

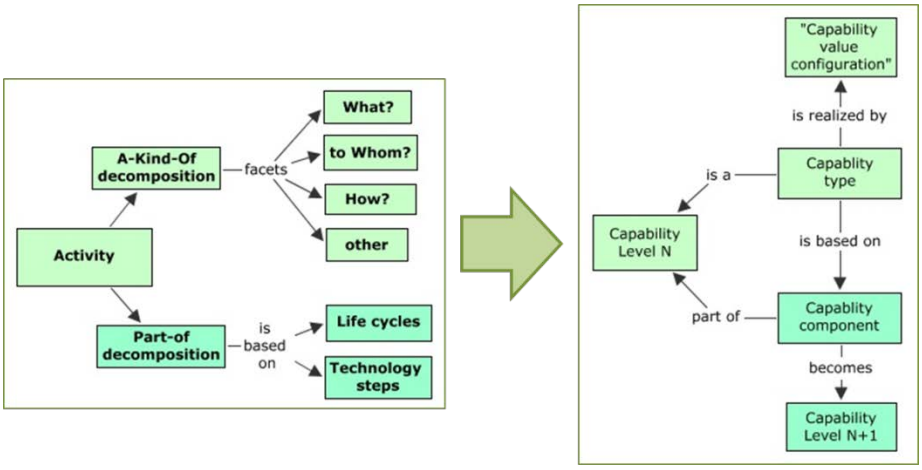

Fig. 1. Two dimensions for activity and capability decomposition

The third principle: capability not only includes “primary” value-creating activities, but also the necessary domain-specific managerial capabilities. Additionally, it sets requirements for enabling capabilities (which can be received as a service). For greater detail, see functional system pattern in [18].

3 Method for linking capabilities with strategic goals and measures (Way of working)

Here are the steps for linking capabilities with strategic goals and measures. The key concepts within this method are represented in the next chapter.

1. Identify the level for linking capabilities with strategic goals and measures (level of strategy): functional domain (top-level capability), business unit or an enterprise as a whole. We use the terms: functional system, business system and corporate system [18],
2. Identify external requirements or, in other words, Customer and Financial perspective goals for the ‘system’ in question. If we chose functional level at the previous step, then the ‘system’ is equal to the capability of any level (level N, for example),
3. Determine the necessity to identify capability types (“capability value configurations”). Main criteria: 1. Differences in “external” requirements for

the capability types? 2. Differences in the underlying technology (and in capability components as a result),

4. Identify capability types ("capability value configurations") based on "WHAT"- and/or "to WHOM" facets. These capability types will either have individual "external" requirements, or elaborate requirements for the considered capability.
5. Elaborate external requirements or, in other words, Customer and Financial perspective goals for the level N capability using the capability types obtained in step 4.
6. Optional. Choose capability types ("capability value configurations") based on "HOW" and/or other technology-influencing facets. Criteria: "external" requirements must match the performance characteristics of the capability type. The chosen capability type predetermines the set of the capability components (level N+1 capabilities),
7. Determine capability components (and subcomponents) for the identified capability types and develop *Capability map (*see the viewpoints in chapter 4*)*,
8. Determine (external) requirements for the capability components (level N+1 capabilities) or, in other words, internal perspective goals for the considered component. *Goal-cascading matrices* (see the viewpoints in chapter 4) are used for this purpose,
9. Determine (external) requirements for the management and enabling capabilities or, in other words, growth perspective goals for the considered component. *Goal-cascading matrices* (see chapter 4) are used for this purpose,
10. Develop *Strategy map* (see the viewpoints in chapter 4) based on the strategic goals obtained in step 5, 8 and 9, and relationships from *Goal-cascading matrices* obtained in steps 8 and 9 (goals with high priority and relationships with high influence power are candidates for the map),
11. Develop measures for the strategic goals obtained in step 5, 8 and 9,
12. Develop strategic initiatives (capability development projects). *Goal-cascading matrices* can also be used here [24].

4 Meta-model and viewpoints (Way of modeling)

The key concepts of the methodology are represented in the meta-model. This meta-model (Fig. 2) rests on the following reference meta-models and ontologies [16, 23, 25].

The definitions of core elements of the metamodel:

Goal – an end state that a stakeholder intends to achieve [16].

Capability – an ability to execute a repeatable pattern of actions. A firm has to dispose of a number of capabilities to be able to offer its *value proposition*. Capabilities are based on a set of Resources [25].

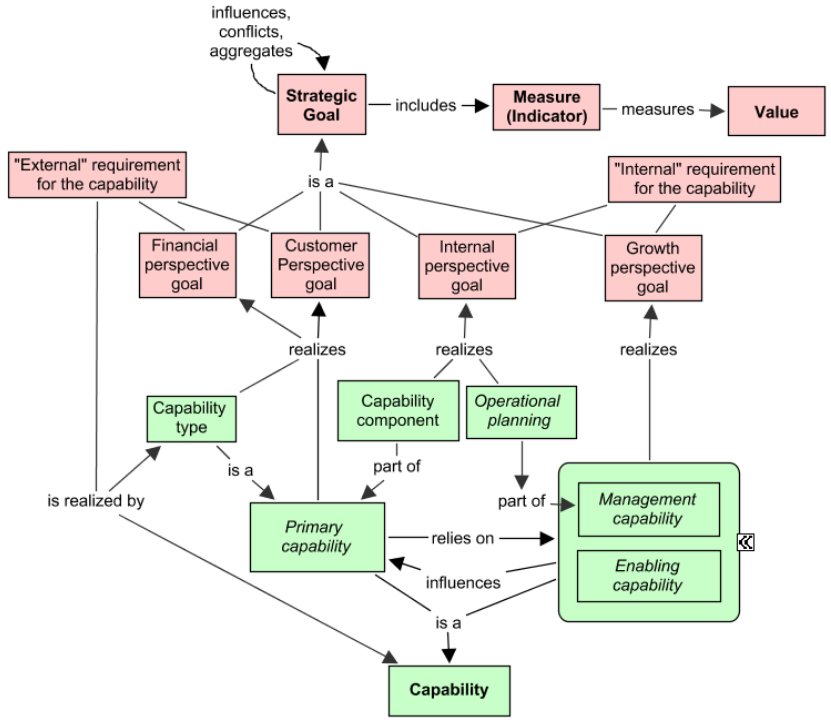

Fig. 2. Meta-model for linking capabilities with strategic goals and measures

In order to link goals with capabilities, we use three types of viewpoints (representation formats): 1. Goal-cascading matrices, 2. Maps, 3. Tables with goals, measures and initiatives.

Goal-cascading matrices are of three subtypes (Fig. 3):

A. “Goal – Capability” matrix, which helps to represent what capabilities realize what goals, evaluate capability influence level and prioritize capabilities based on goal priorities;

B. “Goal – Subgoal” matrix, which helps to link goals of different levels, evaluate influence and prioritize subgoals based on higher level goal priorities;

C. “Goal – Capability (Subgoal)” matrix, which in addition to “Goal – Capability” matrix helps to represent the influence justification or the supporting claim [26] in terms of lower level goals (it is more precise to use Influencers instead of Subgoals in justifications, but typically these Influencers are the basis for Subgoals, so they can be omitted).

The “Goal – Capability” and “Goal – Subgoal” matrices (including weight calculation methods) are based on the Quality Function Deployment (QFD) methodology [27, 28]. QFD application for these particular matrices and business architecture in general is described in [24].

The “Goal – Capability (Subgoal)” matrix is based on the ideas of the SIBYL tool [26, 29], which provides decision matrices to represent design rationale. Items in the

cells of these matrices can be associated with detailed justifications for the various ratings.

A. "Goal – Capability" matrix

	Goal priority	Capability type or component 1	Capability type or component 2	Capability type or component 3
Goal N.1	0,5	⦿	○	
Goal N.2	0,3		△	⦿
Goal N.3	0,2	○		⦿
Capability priority		5,1	1,8	4,5
Related priority		0,45	0,16	0,39

B. "Goal – Subgoal" matrix

	Goal priority	Capability component 1 goals			…
		Goal N+1.1	Goal N+1.2	Goal N+1.3	…
Goal N.1	0,5	⦿	△		…
Goal N.2	0,3				…
Goal N.3	0,2			○	…
Subgoal priority		4,5	0,5	0,6	…
Related priority		0,36	0,04	0,05	…

C. "Goal – Capability (Subgoal)" matrix

	Goal priority	Capability type or component 1	Capability type or component 2	Capability type or component 3
Goal N.1	0,5	⦿ *Justification:* Goal N+1.1 Goal N+1.2 (or Influencers)	○	
Goal N.2	0,3		△	⦿
Goal N.3	0,2	○ *Justification:* Goal N+1.3 (or Influencer)		⦿
Related priority		0,45	0,16	0,39

Legend

Power of influence

⦿ - Strong (9)

○ - Medium (3)

△ - Weak (1)

Fig. 3. Goal-cascading matrices

Maps include: 1. Capability maps, 2."Capability-oriented" Strategy maps (Fig. 4).

We use specialized capability maps, which are based on the functional system's pattern [18] and integrate ideas from [5, 6, 8]. For every Capability X functional system's pattern (and corresponding map) will provide decomposition into capability types and components, besides it will specify capability X's specific management and enabling elements.

The "capability-oriented" Strategy map complies to the standard of traditional strategy maps [14; 19], but has two specialties: 1. It is defined for the Capability concept, while the traditional strategy maps are defined for actors (organization as a whole, business unit, department etc.); 2. Its structure (goal decomposition logic) in Internal and Learning&Growth perspectives follow the structure of the capability in question.

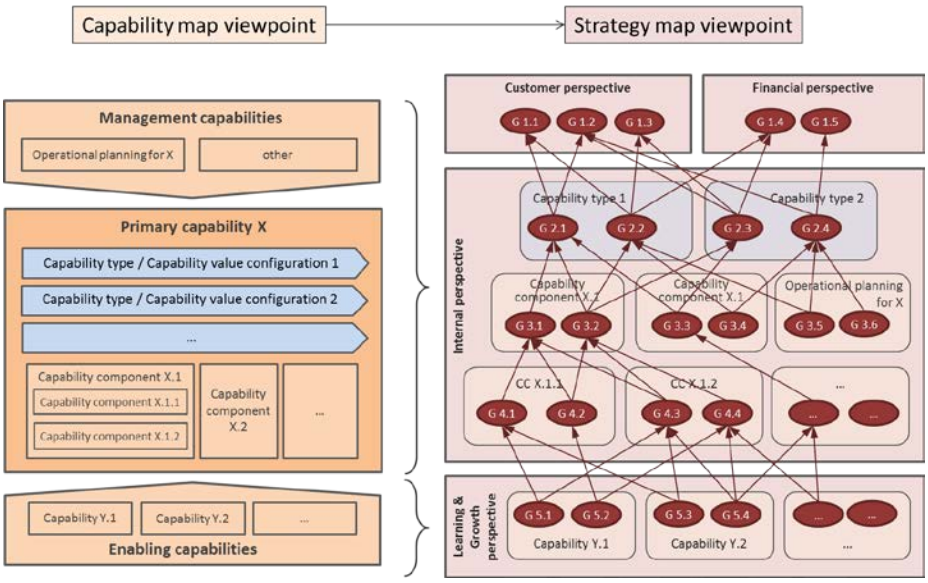

Fig. 4. From Capability to Strategy map

Tables with goals, measures and initiatives are standard and typically have the following structure: Goals – Measure – Target - Initiative.

5 IT support (ORG-Master)

The suggested methodology is mostly supported by the enterprise architecture modeling tool of ORG-Master [30]. This tool supports a domain-specific modeling concept [31] and provides visual modeling tools [32] as plug-ins. Org-Master includes the following modules: enterprise model editor, reporting and query module, diagram editor and meta-editor. Classifications and matrices are the main knowledge representation mechanisms in ORG-Master. Classification/hierarchical list - the representation format for entities, hierarchical relationships between them and values for the properties of entities. Matrix - the representation format for relationships between entities from classifiers. Advanced matrix editing capabilities of ORG-Master are suitable for work with goal-cascading matrices. The tool's special functionality, which is relevant for this paper:

- Provides editing capabilities for the goal-cascading matrices (see Fig. 3). The current version of the ORG-Master supports qualitative work with matrices. The special QFD-plugin supports quantitative work and calculations. This plugin exists for the previous version of the tool and is being developed for the new one.
- Automatically generates capability maps from the repository;
- Provides editing capabilities and automatic generation from the repository for strategy maps (prototype phase);

- Automatically generates textual and table reports and provides report customization capabilities.

6 Application of the approach

The suggested methodology is used by Business Engineering Group company for business alignment, business model implementation, strategic business process management and capability management projects. This methodology or its parts helped to develop and deploy the corporate strategies for 5 companies, business strategies for 7 companies and functional strategies for 4 companies in Russia.

In order to represent some elements of the methodology, let's have a look at the functional sales strategy of the confectionery factory.

Sales capability has the following goals (external requirements): 'Sales plan implementation', 'Sales profitability', 'Correct representation of the value proposition', 'Optimized accounts receivable'.

Sales capability types (or capability value configurations): 'Selling to retail chains', 'Selling to small retail stores', 'Selling to consumers via own retail stores'.

Sales capability components: 'Potential customers identification', 'Managing sales plans', 'Presale work', 'Managing sales orders', 'Operating retail store', 'Contracting', 'Managing customer relationship'.

Let's zoom in on the 'Managing customer relationship' goals. The 'Selling to retail chains' capability type will initiate and set high priority for the following goals: 'Increase in the amount of strategic partners' and 'Customer base stability', while 'Selling to small retail stores' capability type will value 'Customer base increase' and 'Customer profitability'.

7 Related work

There are papers, which set links between goals and capabilities.

Kaplan and Norton methodology [14, 15] shares objectives with this paper – making a strategy-focused company, linking goals and measures with internal behavior in terms of processes, strategic alignment. Similarities: we also use strategy maps with a standard set of perspectives (groups of goals). Differences: 1. Traditional strategy maps are defined for actors (organization as a whole, business unit, department etc.), while our "capability-oriented" strategy maps for capabilities; 2. Goal-cascading matrices, in our approach, help prioritizing goals and capabilities at every level (and select the most important elements for the strategy map).

There are papers, which set links between goals and business processes [33, 34]. Some authors from this category, e.g. [34] use similar matrices in their work (e.g. The Process / Stakeholder Value Matrix), but their use is much more limited. Regardless, our method pays more attention to capability decomposition (e.g. type-component differentiation, 'primary – enabling – management' classification) and use this decomposition for goal cascading. In their EKD approach, Kavakli and Loucopoulos [33] provide detailed meta-models for modeling goals, processes and their

relationships. Differences: 1. This paper's methodology provides more granularity and precision using capability type-component differentiation, capability classification into 'primary – enabling – management' and predefined goal groups (perspectives). 2. There is no predefined method in the EKD approach "one may start at any enterprise knowledge submodel and move to other levels, depending on the situation". 3. Goal hierarchical structure shapes the process architecture in EKD, while in our approach goal structure follows the structure of a capability map.

Hafeez, together with his colleagues, provided framework for determining key capabilities [13]. Similarities between the approaches: 1. External requirements for the 'system' in question are identified similarly – basis for capability evaluation: the Non-financial performance model [13] is similar to the Customer perspective goals and measures, while the Financial performance model [13] is similar to the Financial perspective goals. 2. Consecutive evaluation of different level capabilities is similar to the system of consecutive goal-cascading matrices. Differences: 1. The purpose of the method: evaluate capabilities versus providing goals and measures for capabilities. Top-level measures are only used to set the evaluation criteria. 2. [13] use more complex and precise AHP in order to evaluate capabilities. 3. We provide more granularity and precision because of the aforementioned detailed capability and goals decomposition.

8 Conclusion

The increasingly complex, dynamic, and uncertain nature of today's world has led many enterprises to design and manage their organizations as systems of capabilities (in addition to a system of processes). A capability-based approach makes enterprises more dynamic, support reuse, helps to implement service-oriented architecture, enable companies to focus on core competencies and outsource non-core capabilities. In order to make capability modeling beneficial, enterprises must make capabilities strategy-focused and value-oriented. Such a link with goals and measures will help to prioritize capabilities and transformation initiatives, make solid investment decisions, identify differentiating requirements and criteria operational optimization. This paper provides a methodology for linking capabilities with goals and measures. It integrates a set of principles (way of thinking), a step-by-step method (way of working), viewpoints, and a meta-model (way of modeling). The article also points to the enterprise architecture management tool, which supports the suggested methodology. The main benefits of the method include more precise work with the requirements for capabilities and better identification of the capability components.

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