Alignment between Organization Projects and Strategic Objectives

Inês Garcia

Instituto Superior Técnico

ines.garcia@tecnico.ulisboa.pt

Abstract— **For many organizations having strategic objectives defined means to have their business strategy completed. However, the best-laid strategies can be useless without the proper implementation. By aligning an organization's strategic objectives with its projects, we are able to have a greater understanding of projects and their contribution to achieve strategic objectives. Enterprise Architecture (EA) provides a path between strategy and execution, by addressing stakeholder's concerns and relating strategic and business concepts. ArchiMate is the standard language for modelling EA and enables enterprise architects to describe, analyze and visualize the relationships among business domains. In order to identify the alignment between an organization's projects and strategic objectives, we propose a five steps solution: 1) Identify an organization's strategic objectives, 2) Identify each outcome expected value to the organization, i.e. the importance an achieved target has to the organization, 3) Identify the organization's projects, 4) Represent projects and their expected value and 5) Identify the alignment. By following the proposed method, organizations are able to identify which projects contribute to the achievement of their strategic objectives. The solution proposal was demonstrated in a government owned company. This master thesis was evaluated through a field study in order to apply the proposed method in practice.**

Keywords— Organizational Alignment; Strategic Objectives; Projects; Enterprise Architecture; ArchiMate.

1. Introduction

For many organizations having strategic objectives defined means to have their business strategy completed [3]. However, the best-laid strategies can be useless without the proper implementation [9].

When formulating an organization's strategy, researchers have emphasized the importance of alignment. Organizational alignment requires a shared understanding of organizational goals and objectives.

A project is often considered a success if it is on time and on budget. Although, with the evolving value of well-defined goals and objectives within organizations, understanding how to connect strategy to projects became important [10]. Projects are expected to bring value, and different projects have different strategic importance [11].

Organizations want to link projects to their business strategy, in order to get the best strategy implementation, however, due to the unfamiliarity with the project environment, it becomes a challenge [4]. To ensure projects within organizations contribute to their strategic plan, organizations should start to integrate them in the strategic plan [3].

Each stakeholder requires specific information presented in an accessible form. There are several models addressing business strategy (Business Motivation Model, Balanced Scorecard) but few of them define project as strategic initiatives and, even fewer, relate strategic objectives with projects [4]. The increasing complexity of issues involved, as well as, the growing diversity and heterogeneity of concerns and stakes of involved stakeholders, render pre-existing approaches less adequate.

Enterprise Architecture (EA) provides the insight needed to balance these requirements and facilitate the translation from corporate strategy to daily operations [4]. EA also provides a path between strategy and execution. It allows the organization to determine how certain strategic choices impact an organization's architecture, and also how projects help an organization achieve its strategic objectives.

In order to identify the alignment level between an organizations' projects and strategic objectives, we will use instruments commonly used to organizations. ArchiMate is the standard language for the graphical modelling of EA, enabling enterprise architects to describe, analyse and visualize the relationships among business domains in an unambiguous way [1].

This thesis has the following structure (section): Introduction (1), Research Methodology (2), Research Problem (3), Related Work (4), Proposal (5), Demonstration (6), Evaluation (7), Communication (8), and finally Conclusion (9).

2. Research Methodology

The research methodology applied across this master thesis is Design Science Research Methodology (DSRM) [13] [14], where a research proposal is developed to solve a problem.

DSRM proposes the design and development, followed by a demonstration and evaluation of artifacts, which may include models (abstractions and representations), methods (algorithms and practices), constructs (vocabulary and symbols) and instantiations (implemented and prototype systems) [13]. In this thesis, the artefacts will be designed and evaluated by their own intrinsic value, effectiveness in a specific context, in order to achieve the master thesis goal: the creation of a solution to identify the alignment between organization's projects and its strategic objectives using ArchiMate.

To be coherent with our research work, this dissertation will follow the same structure as DSRM which phases are easily mapped to the structure of this document. Section 3 (Research Problem) and Section 4 (Related Work) identify the problem and

the motivation behind the research work. Section 5 (Proposal) details the objectives of the solution and the proposed solution. The solution is demonstrated in Section 6 (Demonstration) through and evaluated in Section 7 (Evaluation). In Section 8 (Communication) and Section 9 (Conclusion) the research work is concluded with research communication, contributions, limitations and future work.

3. PROBLEM

The Project Management Institute (PMI) [19] ascertained that less than half of organizations report a high alignment of projects to organizational strategy, and that a few of their projects are strategic initiatives – that is, projects designed to achieve formulated strategy. This research shows that organizations' stated strategies can fail to shape what happens in practice.

Every project in an organization should contribute to its strategic plan, but how can we ensure this alignment? By integrating projects within the strategic plan, organizations are able to ensure that their strategies focus on "what we need to do to achieve these goals" and meet their needs and goals.

Organizations use strategy models, methods, frameworks as tools to formulate and analyze strategies, goals and objectives. However, the increasing complexity of issues involved and the growing diversity and heterogeneity of stakeholders' concerns, render those preexisting approaches less adequate.

Each stakeholder requires specific information presented in an accessible way. It is necessary but challenging to obtain an overview of all stakeholders' concerns and needs and their impact on the organization. A good EA provides the insight needed to balance these requirements and facilitate the translation from corporate strategy to daily operations [4].

ArchiMate was developed as a cooperation project between several partners from business and academia to provide concepts and techniques to support enterprise architects in the visualization, communication and analysis of integrated architectures [4]. Many organizations recognize the value of these architectural models in understanding the dependencies between their people, processes, applications, data and hardware.

The challenge to address is how an organization can identify the alignment between its projects and strategic objectives. In order to answer to this question, we need to consider the following ones:

- Can we model an organization's strategic elements and projects using ArchiMate as the modelling language?

- Is it possible to identify the value that a specific project has to the organization and model it using ArchiMate?

- Is it possible to identify the value that a specific achieved strategic objective's target has to the organization and model it using ArchiMate?

- Is it possible to identify and model a correlation between an organization's projects expected values and its strategic objectives using ArchiMate?

More precisely, we want to know which projects within an organization contribute to the achievement of its strategic objectives defined, i.e. if for every strategic objective, an organization can define programs and projects that, after their completion, will achieve those objectives. We will use ArchiMate as the modelling language, since we find it to be the language that best relates these strategic and business aspects of an enterprise.

Therefore, it is important that organizations identify the alignment between their projects and strategic objectives, in order to become more explicit, the degree to which their objectives can be achieved and the impact on their strategy. For that, ArchiMate modeling language provides support to the description, analysis and visualization of inter-related architectures within and across business domains to address stakeholders' needs and concerns.

4. RELATED WORK

In the following sections, we will introduce concepts and relations considered relevant throughout this work.

4.1. Organizational Alignment.

The importance of alignment is widely acknowledging in organizations, and defined in literature as a valuable and scarce resource that has significant consequences to organizational performance [13].

Moreover, Powell [12] connects organizational alignment to competitive advantage and Weiser [14] also describes organizational alignment as "heading in the same direction".

However, there is a considerable difficulty in arriving at a single definition of alignment, given all alignment types and perspectives. Despite their differences, they all address the need to make organization-wide strategic elements, such as vision, mission and goals, more actionable to all employees, relating the work employees do on a daily basis with the organization purpose [2].

Porter [15] defined the concept of strategy as *the creation of a unique and valuable position, involving a different set of activities*. By introducing the notion of different or unique activities, Porter offers a bridge into the world of project management [10].

The development of a project can be held as a strategy to achieve an objective but understanding how these elements relate with each other and with other elements within the organization is challenging.

4.2. Strategy Models

Strategy models relate these concepts and provide strategic management a way to coordinate and align resources and actions with an organization's mission, vision and overall strategy [10]. Among all strategic models familiar to organizations, we focus on the Business Motivation Model (BMM) [7] and Balanced Scorecard (BSC) [6].

The BMM adopted the concept of Business Rule from the OMG specification for "Semantics of Business Vocabulary and Business Rules" (SBVR) [8]. The SBVR allows to capture the semantics of sentences commonly used to express business rules. A Business Rule is a rule under business jurisdiction that always introduces an obligation or necessity [8]. Some Business Rules can be automated in software, becoming an important part of the organization's daily activities. Our proposed solution comprehends the definition of two business rules, based on the SBVR, in order to establish a business vocabulary that supports the definition of certain elements within organizations. Organizations manage complexity and ambiguity better when using business rules to guide behaviour.

The BSC is a successful strategic management method, originated by Drs. Robert Kaplan and David Norton. The BSC has evolved from its early use to become a strategic planning and management framework [10] that highlights the importance to align an organization's strategic planning and management components with projects, allowing organizations to clarify their vision and strategy and translate them into action.

4.3. Strategic Initiatives

Projects may be designed and implemented to meet strategic objectives [10]. By relating an organization's strategic objectives with projects, it becomes clearer the extent to wich the planned strategy is realized and also whether the implementation of projects has indeed value for the business. Every project's expected, measurable value can be in line with one or more of the company's strategic goals [5].

The definition of value will certainly differ in accordance with the organization's focus, strategies and types of projects. All projects have a financial aspect to them, and companies often use their quantifiable value to help them decide if a project is worth the investment. However, it is not always the highest-scoring projects that make it [18]. According to Levine [18], even though the financial value is the primary factor for project prioritization, further aspects should be considered, such as the alignment with the organization strategy and tactical plans.

Associating the value of a project with the organization's business objectives may also help decide if a project is worth the investment or not. Projects are a means for achieving organizational objectives [8].

4.4. Enterprise Architecture

The implementation of initiatives and projects cause changes that can impact an organization's architecture, as well as, contribute to the achievement of its objectives. A well-defined architecture is an important asset in positioning new developments within the context of the existing process, IT systems, and other assets of an organization, as well as, helping in identifying necessary changes [4].

EA, by definition, is a coherent whole of principles, methods, and models that are used in the design and realization of an enterprise's organizational structure, business processes, information systems, and infrastructure [9].

The role of the architect is to address stakeholders' concerns by identifying and refining motivation and strategy, developing and creating views of the architecture [6]. Moreover, EA provides a path between strategy and execution that can bring strategic and business concepts together by addressing stakeholder's concerns regarding all business' aspects and domains.

ArchiMate [1] is a modeling language from The Open Group that provides a uniform and graphical representation of EA. In this thesis, we will only focus on elements from ArchiMate's core layers, Motivation and Implementation & Migration extensions described in the following sub-section.

4.5. ArchiMate

ArchiMate [1] is an open and independent EA modelling language from The Open Group. It enables enterprise architects to describe, analyze and visualize the relationships among business domains [1]. Different stakeholder groups may require different notations in order to understand an architecture model or view. ArchiMate provides viewpoints that are a means to focus on particular aspects of the architecture, allowing the representation of the proposed solution in a coherent and detailed way.

In this thesis, we will consider the ArchiMate 3.0 Specification layers, extensions and aspects represented in Figure 1. Besides representing ArchiMate layers, Figure 1 also represents the fundamental separation into active structure (who acts), behavior (what act) and passive structure (upon what) [17].
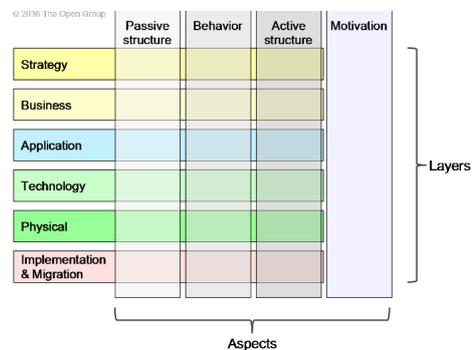

Fig. 1. ArchiMate Framework [17].

Within context of this work, we will focus on elements from the core layers (Business, Application and Technology) and from the Motivation and Implementation & Migration extensions. It will allow us to better represent and relate motivational concepts, regarding an organization's intentions towards their customers, to improve its business or optimize its structure and processes, with elements used to define and represent the change that developing projects may bring to the organization.

We use ArchiMate's Value element to represent the project value to the organization.

In [16] the authors argue that value should not only be considered in relation to an organization's environment but also internally. Any architectural element (or project) has value for its users. The new ArchiMate Specification was created in order to better address this relation between EA and business strategy, by adding concepts for modelling strategy, increasing the usage of EA in supporting strategy execution.

In ArchiMate's Specification 3.0, the Value element (Figure 2) is defined as the *relative worth, utility, or importance of a core element or an outcome*. Value may apply to what a party gets by selling or making available some product or service, or it may apply to what a party gets by buying or obtaining access to it [1].
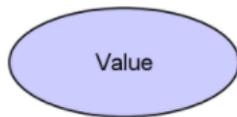

Fig. 2. Value Notation [1].

Value is often expressed in terms of money, but it has long since been recognized that non-monetary value is also essential to business [1].

Although, a project financial value has importance, we focus only on the non-monetary value of a project to the organization, considering it to be the element that allows the connection between projects and strategic objectives.

5. PROPOSAL

In this research, we aim to propose a solution, using ArchiMate as the modelling language, to identify the alignment between an organization's projects and its strategic objectives.

EA, by supporting a holistic organization view, helps in designing all business domains in order to meet vision, mission, and business goals and to ultimately deliver enterprise strategy. ArchiMate offers a cohesive link among the core layers (business, application, and technology) and among each layer and extensions (Strategy, Motivation and Implementation & Migration).

Modeling strategy with ArchiMate provides new possibilities for linking strategy to portfolio management and the architecture of an organization. Relating business strategy,

enterprise architecture and projects provides a way to align an organization's strategy with its tactics and operations.

In Figure 3 below, we represent the proposed method's steps for identifying the alignment between an organization's projects and its strategic objectives. The solution proposal has five steps.

Fig. 3. Proposed Method's Steps

Firstly, we identify the organization's strategic objectives and respective outcomes (achieved targets), representing their expected value to the organization. Afterwards, we identify the organization's projects and represent their expected value to the organization. Finally, identify the alignment between an organization's projects and strategic objectives.

In Section 2, we formulated the research problem that restricts the spectrum of the architecture views of our system of interest. Table 1 represents the architecture viewpoints used in each step of the proposed solution.

Solution's steps	ArchiMate Architecture Viewpoint		
	Organization viewpoint	Motivation viewpoint	Project viewpoint
1. Identify organization's strategic objectives.		x	
2. Represent objectives' outcomes and their expected values.		x	
3. Identify organization's projects.	x		x
4. Represent projects and their expected values.			x
5. Identify the alignment between projects and strategic objectives.			x

Table 1. Solution's steps – Architecture viewpoints.

Figure 4 relates all viewpoints used in the proposed solution and represents all elements and relations between them. We propose a solution using only elements that will help us identify the alignment between an organization's projects and strategic objectives.
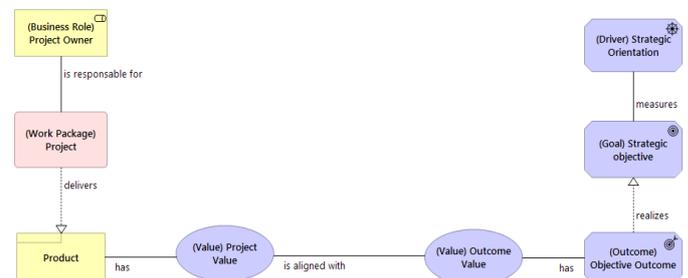

Fig.4. Generic viewpoint to identify the alignment between projects and strategic objectives.

We represent a specific project through the Work Package element. A project has a project owner, responsible for it. If the organization has a portfolio (a collection of projects and

programs), we can also represent the program associated with the project. A Program is also represented through the Work Package element.

Every project delivers an end result, either tangible or intangible, and we represent them using the Product element. A Product may be offered both internally to the organization and externally to customers and has a certain value to the organization associated with it. The Value element, defined as the project's expected value to the organization, represents the importance and utility of a project to the organization and it is the element that will allow us to associate a specific project to the organization's strategic objectives.

6. DEMONSTRATION

We used a midsized government owned company for the demonstration, named DemoCorp, that has a portfolio with more than seventy projects and eight thematic programs. In order to better address the identified problem and demonstrate the proposed solution we selected ten projects in the portfolio. We chose projects from two different programs: Innovation, Research & Development and DemoCorp Certification and Security. The first program with eight projects and the second program with two projects.

In this Section, we will describe the five steps of our proposed solution represented in Figure 3, to identify the alignment between an organization's projects and strategic objectives.

6.1. STEP 1 – Identify organization's strategic objectives.

Input: Documentation regarding DemoCorp's strategy (e.g. Strategic Plan).
Output: Identification of DemoCorp's strategic orientations (drivers), strategic objectives and respective outcomes.

When analyzing DemoCorp's strategic plan, we identified DemoCorp seven drivers described as strategic orientations, its twenty-one strategic objectives and respective outcomes.
In Figure 5, we represent the association between DemoCorp's Increase internal efficiency strategic orientation, its strategic objectives and outcomes.
The strategic objectives and outcomes identified will be the input for the next step of the proposed solution.

Fig. 5: Association between DemoCorp's Increase internal efficiency strategic orientation, its strategic objectives and outcomes.

6.2. STEP 2 – Represent objectives' outcomes and their expected values.

Input: Documentation regarding the DemoCorp's strategy.

Output: Definition of objectives' outcomes expected values.

In this step, we analyze documentation regarding DemoCorp's strategy, as well as, strategic objectives and outcomes identified in the previous step, to identify each outcome expected value to DemoCorp. The Outcome Value represents the importance of the outcome and respective strategic objective to the organization, i.e. what the organization gains with the strategic objective achievement.

In order to represent every outcome value, we established the following business rule, based on the SBVR [8]: It is obligatory that each outcome value is defined by exactly one transitive verb followed by the direct object that complements the verb.

In [4], it is recommended to express the name of a Value as an action or state that can be performed or reached. We established this business rule to simplify its definition and follow that recommendation. A transitive verb is an action verb expressing a doable activity and, it must have a direct object, something or someone who receives the action of the verb. With the transitive verb, we ensure the outcome value as an action and, with the direct object, its conclusion.

Figure 6 represents the strategic objectives, outcomes and their expected values to DemoCorp. To rationalize and optimize its structure and processes, DemoCorp must reduce its operating costs. By doing so, DemoCorp optimizes its processes and infrastructure. To reinforce business strategy, DemoCorp has to fully execute its strategic budget. By doing so, DemoCorp will increase strategic initiatives. To promote management culture and risk prevention, DemoCorp has to address four risk management scenarios. By doing so, DemoCorp will improve its risk management.
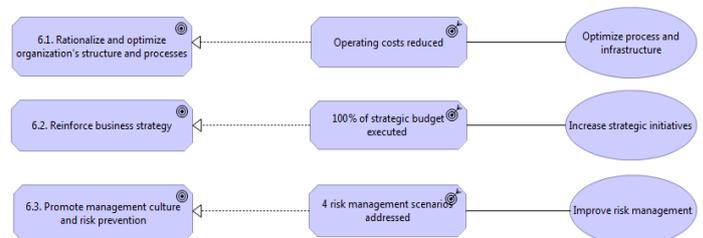
Fig. 6: Strategic objectives outcomes and their expected values.

6.3. STEP 3 – Identify organization's projects.

Input: Documentation regarding the DemoCorp's projects.
Output: Identification of the DemoCorp's projects and project owners.

To identify DemoCorp's projects, we analyzed documentation regarding DemoCorp's portfolio. DemoCorp has eight thematic programs and, to demonstrate the proposed solution, we selected ten projects from two thematic programs. We were able to identify all ten projects and respective project owners, as well as, the programs associated with each project. DemoCorp's project owners are defined as organizational units.

We identify in Figure 7 below, the projects selected and respective programs. We were able to identify all projects and programs, as well as, respective project owners. DemoCorp's project owners are defined as organizational units.
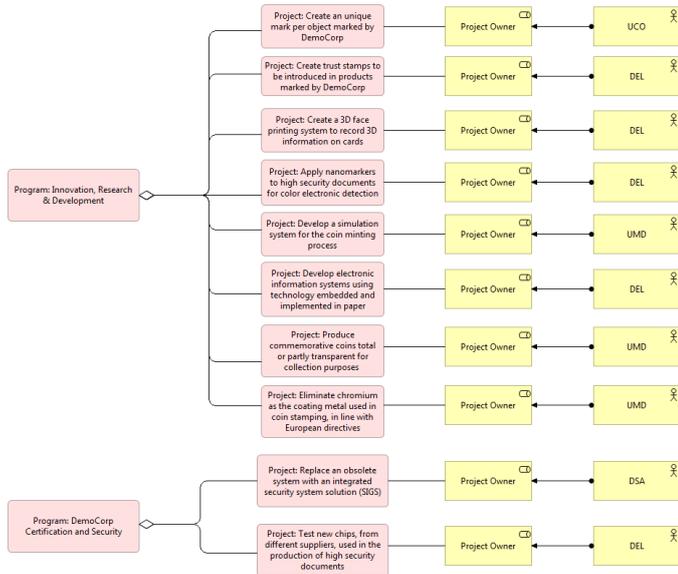

Fig. 7. DemoCorp's projects identification viewpoint.

6.4. STEP 4 – *Represent projects and their expected values.*

Input: Documentation regarding the scope and purpose of projects identified in Step 3.
Output: Identification of projects expected value to the organization.

In this step, we analyze documentation regarding the scope and purpose of each project identified in Step 3.

A project value is the utility or importance of that project to the organization and, to help identify it, we analyzed all ten projects' scope documentation (e.g. Project Plan). The identification of projects' final product helps us define its expected value to the organization. To represent the **Project Value**, we established the following business rule, based on the SBVR [8]: It is obligatory that each project value is defined by exactly one transitive verb followed by the direct object that complements the verb.

Figure 8 represents the **SIGS** project, with the purpose of replacing an obsolete system with an integrated security system. This project provides a new security and facility management system that optimizes DemoCorp's security and facility management function.
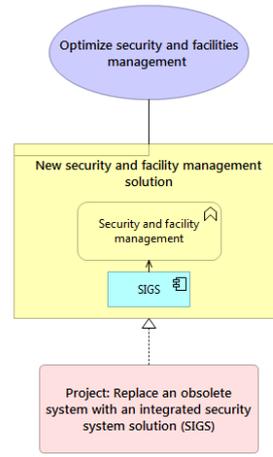

Fig. 8: DemoCorp's SIGS project and expected value.

Using the business rule defined in the previous Section to describe the project value, we selected "optimize" as the transitive verb, since this project optimizes DemoCorp's internal business functions. As the complement to the verb we analyzed the product delivered, a new security and facility management solution. Therefore, the project value to the organization is to optimize DemoCorp's security and facilities management.

6.5. STEP 5 – *Identify the alignment between projects and strategic objectives.*

Input: Organization's projects and their expected value (output Step 4) and the organization's objectives and expected values (output Step 2).
Output: Solution – Identification of projects in line with DemoCorp's strategic objectives.

In this step, we will analyze organization's projects and their expected value viewpoints from Step 4, as well as, the organization's strategic objectives and their expected value identified in Step 2.

Every project has an expected value for the organization (output of Step 4), defined according with the business rule. Every strategic objective has an outcome which value is also defined accordingly with the business rule. If the value that a project has to the organization is similar to the outcome value defined for each strategic objective, then both values are in line and, consequently, that project is aligned with that strategic objective.

If a project value does not correspond in any way to an outcome value, then we will only represent the project and its expected value, without the associative relation.

In Figure 9 below, we represent the **SIGS** project, its expected value to DemoCorp and the outcome values in line with the project value. SIGS is an integrated system solution that optimizes DemoCorp's security and facilities management functions.

Fig. 9: Alignment between SIGS project and DemoCorp's strategic objectives.

The project value is "Optimize security and facilities management". By optimizing a DemoCorp's function, it is in line with the "Optimize process and infrastructure" value. This outcome value is associated with the "6.1. Rationalize and optimize organization's structure and processes" strategic objective.

The SIGS project value is similar/corresponds to the outcome value associated to the strategic objective 6.1. Therefore, we can conclude that the SIGS project contributes to the achievement of strategic objective 6.1.

7. EVALUATION

The evaluation of this work was accomplished by using the demonstration scenario at one government owned company.

In order to evaluate the proposed solution, we will analyze DemoCorp's alignment identification between its projects and strategy before and after applying the proposed solution. Afterwards, we will compare both scenarios identified in the analysis above, in order to establish if, with the proposed solution, we were able to add or improve quality and quantity of the alignment information between DemoCorp's projects and strategic objectives.

7.1. Before applying the proposed solution

As mentioned before, our proposed solution was demonstrated in DemoCorp, a midsized government owned company, with a Project Management Office (PMO) unit that ensures the monitoring of its various programs and projects, in order to increase DemoCorp's efficiency in executing them.

The creation of a PMO in DemoCorp arose awareness to the need of aligning DemoCorp's projects and its strategic objectives. Organizations tend to evaluate the achievement of their strategic objectives using strategic tools and methods that, quite often, focus just on establishing measures to assess if either the objective was accomplished or not.

The PMO established a correlation between each project and DemoCorp's strategic orientations and its strategic context. These are the only two indicators that provide information about projects alignment with DemoCorp's strategy. This relation is established by a PMO employee based on his/hers interpretation of the projects' scope and purpose.

Project	Strategic Context	Strategic Orientation
SIGS	Institutional	6.Internal Efficiency

Table 2. Relation between DemoCorp's projects and its strategy before the proposed solution.

Therefore, even with the effort to establish that relation, we were not able to find information relating DemoCorp's projects and its strategic objectives.

This master thesis derives from that need to identify which projects are aligned with which DemoCorp's strategic objectives. Our proposed solution satisfies this need by identifying how to relate both subjects.

7.2. After applying the proposed solution

After applying the proposed solution, we were able to identify every projects expected value to DemoCorp. Through that value, we were able to identify if a certain project is in line with DemoCorp's strategic objectives. We were also able to identify if a certain project is not aligned.

Before the proposed method, the PMO identified for each project, its strategic context and strategic orientation, as represented in Table 2.

With the proposed solution, we were able to add two more indicators, projects value and strategic objectives as represented in Table 3 below.

Project	Project Value	Strategic Context	Strategic Orientation	Strategic Objective
SIGS	Optimize security and facilities management	Institutional	6.Internal Efficiency	6.1. Rationalize and optimize organization's structure and processes

Table 3: Relation between DemoCorp's SIGS and its strategy after the proposed solution.

Therefore, with the proposed solution applied, we were able to identify if the selected projects are in line with DemoCorp's strategic objectives, as well as, their expected value. This analysis contributed positively to DemoCorp, since we were able to improve the quality and quantity of information regarding projects and DemoCorp's strategic objectives.

By following the proposed solution, it will be possible for the organization to continue identifying if an ongoing project is in line with its strategic objectives.

8. COMMUNICATION

In this Section, we aim to communicate the problem and its importance, the artifact, its utility and novelty, the rigor of its design and its effectiveness to researchers and other relevant audience [13].

To communicate our work, we have submitted two papers to the following conferences:

- *20th International Conference on Enterprise Information Systems (ICEIS 2018).* The paper proposes our method to identify the alignment between an organization's projects and its strategic objectives using ArchiMate as the modeling language.

9. CONCLUSION

The alignment between projects and programs with an organization's strategy have become an essential part of navigate in an increasingly competitive market environment. The fact is that without the right projects and programs to carry it out, even the most forward-thinking strategies can fail. Organizations use strategy models, methods, frameworks as tools to formulate and analyze strategies, goals and objectives. These tools tend to narrow the organization focus by establishing measures to assess if strategic objectives are

accomplished or not, lacking the definition of actions and initiatives to do so.

EA and ArchiMate allows us to understand and model an organization's strategic objectives, projects and their expected value to the organization, as well as, represent other elements of an organization's architecture. It also allows to model relations between these concepts.

In Section 4, we presented the proposed solution steps and viewpoints used to identify the alignment between an organization's projects and strategic objectives. We proposed the following five steps: 1) Identify an organization's strategic objectives, 2) Identify each outcome expected value to the organization, i.e. the importance an achieved target has to the organization, 3) Identify the organization's projects, 4) Represent projects and their expected value and 5) Identify the alignment.

The proposed solution was applied in DemoCorp, a government owned company. We able to model DemoCorp's strategic elements and projects using ArchiMate and identify the expected value of a project and an achieved target to DemoCorp. Finally, we were able to identify and model a correlation between DemoCorp's projects expected values and its strategic objectives. Our main research contribution is the development of a method for identifying the alignment between an organization's projects and strategic objectives using ArchiMate.

The proposed method does not provide a way to quantify the relation between projects and strategic objectives. It only allows to identify that a certain project is in line with a certain strategic objective, i.e. that a project contributes to the achievement of a strategic objective. Having established the relation between an organization's projects and strategic objectives, a future work would be to quantify how much each project contributes to the achievement of the aligned strategic objectives, as well as, to identify projects that contribute/influence negatively strategic objectives (i.e. projects with a high investment influence negatively costs reduction objectives).

REFERENCES

[1]   The Open Group, ArchiMate 3.0 Specification, The Netherlands: Van Haren Publishing, 2016.

[2]   Strategy Management Group, "Strategic Planning Basics", 2016. Available in: http://www.strategymanage.com/strategic-planning-basics/.

[3]   V. Anyosa Soca. "Linking portfolio, program, and projects to business strategy: a way to gain competitive advantage in this turbulent time", paper presented at PMI® Global Congress, North America, Orlando, FL. Newtown Square, 2009.

[4]   H. Jonkers, M. M. Lankhorst, H.W.L. ter Doest, F. Arbab, H. Bosma and R.J. Wieringa, "Enterprise architecture: Management tool and blueprint for the organization". Springer Science + Business Media, 2006.

[5]   Project Management Institute. "The Project Management Office: Aligning Strategy & Implementation", White Paper published in Project Management Institute, April 2014.

[6]   R.S. Kaplan and D.P. Norton, "The Balanced Scorecard: Measures that Drive Performance", Harvard Business Review, 2005.

[7]   OMG specification, "Business Motivational Model (BMM)", 2015.

[8]   OMG specification, "Semantics of Business Vocabulary and Business Rules (SBVR)", 2017.

[9]   The Economist Intelligence Unit, "Why good strategies fail: Lessons for the C-Suite", Project Management Institute (PMI), 2013.

[10] A. Brown and J.Russel. "Getting your projects to meet strategic goals". *PMI Global Congress Proceedings*, Sydney, Australia and Denver, CO, USA, 2008.

[11] P.W.G. Morris and J.K. Pinto. "The Wiley Guide to Project, Program & Portfolio Management", John Wiley & Sons, Hoboken, New Jersey, 2007.

[12] T.C. Powell, "Organizational alignment as competitive advantage.", Strategic Management Journal, 1992.

[13] M. Alagaraja, K.Rose, B, Shuck and M.Bergman, "Unpacking organizational alignment: the view from theory and practice", Journal of Organizational Learning and Leadership, 2015.

[14] J.R. Weiser, "Organizational alignment: Are we heading in the same direction", The Kansas Baker, 2000.

[15] M. Porter. "What is Strategy?". *Harvard Business Review*, 1996.

[16] M.E. Iacob, L.O. Meertens, H. Jonkers, D.A.A. Quartel, L.J.M. Nieuwenhuis and M.J. van Sinderen. "From enterprise architecture to business models and back". Springer-Verlag Berlin Heidelberg, 2012.

[17] Gerben Wierda. "ArchiMate 3 Review". Enterprise Architecture Professional Journal, 2016. Retrieved from: http://eapj.org/archimate-3-review/.

[18] A.L. Harvey, "Project Portfolio Management: A Practical Guide to Selecting Projects, Managing Portfolios and Maximizing Benefits", Foreword by Max Wideman, Jossey-Bass, a Wiley Imprint, 2005.

[19] Project Management Institute's Pulse of the Profession. "The High Cost of Low Performance: How will you improve business results?", 8th Global Project Management Survey, 2016.