BUSINESS IT ALIGNMENT
A Survey

Karim Doumi, Salah Baïna and Karim Baïna

ENSIAS, Mohamed V - Souissi University, Souissi, Morocco

Keywords: Strategic alignment, Enterprise architecture, Goals modelling, Strategy, Business process, Information system.

Abstract: Nowadays, the strategic alignment of information systems has become a priority in most large organizations. It is a question of aligning the information system on the business strategies of the organization. This step is aimed at increasing the practical value of the information system and makes it a strategic asset for the organization. In the literature several approaches have been developed to solve the problem of alignment. For example the approach of alignment between architecture and the business context, the approach needs oriented, approach alignment between process and information system...etc. In this paper we propose a detailed study of each approach (benefits and limitation) and we propose a comparison between these different approaches.

1 INTRODUCTION

The strategy of the enterprise is to set up the long-term commitments to reach the explicit objectives. It is a question of studying, via real cases, how an enterprise can position itself in an international competing. The alignment of this strategy with the evolution of information system requires an alignment allowing the perfect coherence of all the actions and the decisions with the strategic objectives of the enterprise. This alignment will transform strategic objectives into operational actions to align them in the information system.

Today, it is not quite enough to build powerful information systems. In order for the enterprise to be performing and be able to compete and evolve, its information systems and business processes must be permanently aligned and in perfect coherence with its strategy.

Many authors have shown the importance of alignment in the evolution of the enterprise (Luftman and Maclean, 2004; Luftman, 2000) and according to (Baïna, 2008; Chan et al., 1997; Croteau and Bergeron, 2001; Tallon and Kraemer, 2002), this alignment has a great influence on the performance of the organization and any rupture in the process of alignment causes a fall of the organization's performance.

If the interest of alignment is greatly recognized,

its implementation remains very limited. According to (Luftman and Maclean, 2004; Renner et al., 2003), few leaders consider that the strategy and the information systems are aligned. Thus, this implies that actors of the organization are not able to distinguish between alignment and non-alignment.

Also, the absence of methods of maintenance of alignment makes the task extremely difficult at the decisional level.

In the literature several approaches have been developed to solve the problem of alignment. In this paper we present an evaluation of 7 approaches to alignment, which we felt were relevant, applicable and representing the state of the art.

The seven approaches are:

- Approach of Enterprise Architecture : Zachman Framework for alignment documentation (Zachman, 1987)
- Approach of Enterprise architecture (French): urbanization of Information System (Longépé, 2001).
- Approach of modeling and construction of alignment oriented needs (Bleistein, 2006).
- Approach of evaluation and evolution of strategic alignment (Luftman, 2000)
- Approach of modeling and construction of alignment between the environment, processes and the systems (Wegmann, 2005)

- Approach of evaluation of the degree of alignment of the business process and Information system (Etien, 2006; Etien and Salinesi, 2005)
- Approach of evaluation of the degree of alignment between the couple strategy of the enterprise and <Business process, information system> (Thevenet et al., 2009)
- Approach oriented values (Ideas, 2003).

This document is structured in four parts. In Section 2, we present a set of approaches to strategic alignment. Each approach is briefly presented (description and limits). In Section 3, we present a comparative study between these approaches. We conclude and present our work in progress in Section 4.

2 APPROACHES OF STRATEGIC ALIGNMENT

2.1 Approach of Enterprise Architecture "Zachman"

Approach:
Several studies have shown that enterprise architecture is practiced in major international organizations and governmental institutions that have adopted it as a tool of strategic governance

Several frameworks and methods of enterprise architecture are available on the market: Zachman, TOGAF, AEP, JTA, DODAF, CIMOSA, SAGA…etc and most used are probably Zachman and TOGAF.

Zachman proposes a framework in which there are 36 models distributed according to six prospects and six aspects of the enterprise and system.

In this framework there are three categories of model:

(1) Business models (2) system information models and (3) technological models (IT).

The first type of models is present in the first two rows of the matrix and is interested in the enterprise and its environment (strategy, objectives, activities ...). The 2nd type on the 3rd line and describes the architecture of information systems. Finally the last type of model is on the last two lines that describe the technical architecture of the enterprise.

Limits:
Real experiments have shown interest of the Zachman Framework (Brown, 2005) to help manage change and improve the availability of enterprise

documentation. However, several practical issues were raised (Meersman, 2004; Khory and Simoff, 2004). We can cite for example the lack of methodological process to guide a process of alignment, lack of dynamics and lack of integration of different views.

2.2 Approach of Enterprise Architecture (French): Urbanization of Information System (Longépé, 2001)

Approach:
If it has been usual for a long time to speak about architecture of the information systems, the concept of town planning is more recent but spreads quickly.

The problems thus consist in making the information system most reactive possible (i.e. able to evolve quickly to answer the new requests) while preserving the informational inheritance of the enterprise. The urbanization of the information systems aims at bringing an answer to this need.

The approach of urbanization of information system was studied by many authors (Longépé, 2001; Bonne and Maddaloni, 2004). The works of these authors supplement the works relative to the enterprise's architecture (Zachman, 1987). All these authors use the metaphors to found the concept structures and urbanization of information system, in particular the metaphor of the city is used like base of urbanization of information system. Thus in the city of information, the individuals are the information applicants. The plan of urbanization defines a common vision of what would be the target i.e. an information system urbanized and aligned on the strategy of the organization.

Methods of urbanization of information systems have all in common eight essential steps:

- Model business processes
- Document the current (As-Is)
- Define the target « future » (To-Be)
- Define a migration plan.
- Use a modeling tool for documenting the EA
- Set rules.
- Assist projects
- Manage projects

Various methods have been proposed in the context of urban information systems. The most known of these methods is that proposed by (Longépé, 2001). The approach is organized into seven phases which are: (1) planning, (2) the revision of the strategic axes, (3) analyzing the

existing situation, (4) the definition of the strategy, (5) develop a convergence plan, (6) publication of the strategy, and (7) updating the strategy.

Moreover, the method proposes to use the mapping information system for documentation and analysis of modularity.

The main goal of mapping is the decomposition of the information system, is so a facet of the decomposition of the enterprise. In the approach of urbanization information system, these facets are organized into levels: enterprise strategy, business process, function, application and technical architecture.

Limits:

Urbanization Information System provides a guide to manage the strategic alignment to define future Information system. However, the method of this approach does not say how to ensure an evolution of enterprise strategy, its business processes and its information system and how to measure and improve the alignment between these elements.

2.3 Approach of Modeling and Construction of Alignment Oriented Needs (Bleistein, 2006)

Approach:
Bleistein (Bleistein, 2006) seeks to align enterprise strategy to the system. For this they propose requirements engineering approach that brings in the same model (1) the strategic objectives of the organization and (2) the activities and processes to which these objectives are achieved.

This approach uses goals modeling for modeling the enterprise strategy. Bleistein use the model BRG (Business Rules group) to organize enterprise strategy. This model is a conceptual framework consists of two concepts: (1) Ends: that are the things the enterprise wants to reach as (goal, objective, vision) (2) Means: the things that the company uses to achieve those purposes as (strategy, tactics, mission).

This model does not use specific language of representation that is why Bleistein uses the modeling language I *(Yu, 1997). He proposed to match the model I * with BRG to make it operational.

This approach allows building a system aligned with enterprise strategy and business processes. It is based on:

- Modeling strategy using the model I *
- Defining the business context using problem fram (Jackson, 2001). This step is based on the

clear separation between the context of existing problems and solutions to build.
- The modeling of business processes through diagrams roles activities.

Business role models can make the link between goals, objectives and tasks defined in the model I * and contexts (system, domain).

In this approach the relationship between entities is via a typology of links. Typology of linkages of the I * and "references links" that exist in the diagrams.

Limits:
The approach of Bleistein is interesting in the sense that it takes into account the strategic level in the presentation of the alignment but is impractical and very complicated to master it.

Is an approach to building alignment and not the evaluation and evolution of the alignment.

The guide is not defined, the method proposes to use the fram problem of Jackson and match the BRG model with elements of model I * but there is no clear guide to construct the alignment.

2.4 Approach of Evaluation and Evolution of Strategic Alignment (Luftman, 2000)

Approach:
Luftman (Luftman, 2000) proposes a framework for measuring the alignment between two entities: the enterprise strategy and IT strategy. This framework incorporates the fundamentals of the CMM model *(Capability Maturity Model)*.

The approach aims to assess and improve the relationship of alignment between enterprise strategy and IT strategy.

The approach does not define any relationship between the elements of the alignment. Luftman tries to explain the "understanding of IT by the business".

To identify the level of alignment of an organization, six criteria were identified:

- The degree of maturity of communication.
- The maturity of the ability to measure.
- The maturity to lead (steering).
- The maturity of the partnership between business and IT.
- The degree of maturity of the architecture.
- The maturity of knowledge.

Guidance is proposed through six steps:

• (1) Define goals and develop a team of managers and engineers from functional entities. The team

must assess the maturity of the alignment between enterprise strategies and IT strategies.

(2) Understanding the link between business and IT. The team assesses each of the six criteria with the objective of converging towards a single vision.

(3) Analyze gaps. This step aims to analyze the actions needed to improve alignment. For each criterion, the differences are fixed between the current situation of organization and the situation that the team has set. The high level of maturity serves as a guideline to identify actions to put in place.

(4) Specifying actions: Knowing the maturity level of alignment helps identify actions to improve alignment. This step aims to assign tasks to each of the gaps identified in the previous step in precisely defining the documentation, resources, risks, measures to ensure that the problem of the gap has been resolved.

(5) Choose and evaluate success criteria. This step requires review the goals and revisit regularly measurement criteria identified to assess the implementation of projects.

(6) Maintain alignment. This step is, according to Luftman (Luftman, 2000), the most difficult.

Limits:

The approach of Luftamn gives guidance for the construction of the alignment. The approach does not seek to change the alignment of the elements but to achieve a higher maturity level of alignment between strategic objectives and IT strategy.

2.5 Approach of Modeling and Construction of Alignment between the Environment, Processes and the Systems (Wegmann, 2005)

Approach:
The SEAM approach ("Systemic Enterprise Architecture Method") aims to build a future situation in which the company and its system are aligned (Wegmann, 2005).

The SEAM method focuses not only on the alignment between the system and the company but also a managerial view "between the enterprise and its environment, the market...)

In SEAM, the company is represented by a hierarchical model. Each level contains systems. A system may be an information system, department, enterprise or corporate of enterprise or even a market.

A SEAM enterprise model has three levels: (1) the business level representing enterprise, (2) the

operational level and (3) the level of information technology

In SEAM, the alignment is defined as follows:

• Alignment of sets of entities from different organizational levels: two representations of a set of entities in two adjacent levels of the organization are aligned if it is possible to identify the conduct described in the highest level in the conduct described in the lowest organizational level.

• Alignment of sets of entities of different functional levels: two representations of entities with two different functional levels are aligned if it is possible to identify in the conduct described above in the functional behavior described at the functional level as low.

• Alignment of business and information technology: the alignment of business and IT requires alignment of sets of entities from different organizational levels and alignment of sets of entities of different functional levels.

Limits:
The SEAM method uses the same notations in different levels and thus between the different elements of alignment. The SEAM method does not take into account the particularity of each level of abstraction.

2.6 Approach of Evaluation of the Degree of Alignment of the Business Process and Information System (Etien, 2006)

Approach:
The method ACEM (Alignment Correction Method and Evolution) focuses on the alignment between two entities, business processes and information system (functional level).

The method proposes to adapt the model business processes with the system information model in order to restore the alignment between these two entities.

ACEM method proposes an approach that allows an organization to move from a present situation to a future situation.

The present situation is characterized by the As-Is models PM (Process Model) and As-Is SM (System Model) that represent business processes and system functionality. The future situation is characterized by the models To-Be PM and To-Be SM representing respectively the state of business and system, after evolution.

The methodology proposes three steps ACEM, presented and detailed in (Etien, 2006). The three

steps are: (1) Obtaining the pivot model for a unified view of the process model and system (2) The evolution of the pivot model with the identification of gaps that can express a change or improvement in the alignment (3) analyze of the gaps identified in the pivot model system models and processes.

ACEM method takes into account requirements changes respectively from (1) dysfunction of the system or process (2) breaks the relation of alignment.

The requirements of change are expressed as differences between the model pivot As Is and model pivot To Be. Evolution is the common model, pivot, and then there is an impact on entities to align, so it is a method of evolution interdependence type.

Limits:

This approach allows to model and evolve the alignment between business process and information system but do not take into consideration the strategic level in the representation of the alignment.

2.7 Approach of Evaluation of the Degree of Alignment between the Couple Strategy of the Enterprise and (Business Process, Information System) (Thevenet et al., 2009)

Approach:
The method INSTAL (Intentional Strategic Alignment) focuses on the alignment between two levels, strategic and functional level.

The operational level includes business processes and information systems. The strategic level involves the enterprise strategy and needs at high level.

This method proposes first to document the strategic alignment by: (1) the intentional model representing the two levels and (2) the definition of alignment links between this model and the elements of the enterprise (documents, methods, procedures) from the strategic and operational level.

The approach uses the formalism maps (Rolland, 2007) to represent elements of the two levels.

Links strategic alignment, which are attached to the intentions of MAPs, defines all the elements justifying strategic intentions and all operational elements contributing or not to them.

Then INSTAL offers metrics and measures. Metrics provide quantitative or qualitative view of the alignment. Each metric or measure is defined by a specific method. The methods may be objective (based quantification of numerical rules) or subjective.

The evolution guided by INSTAL takes place at the operational level, and simultaneously on business processes and information systems. As such, INSTAL can be seen as a methodological approach that guides the co-evolution of business processes and information system with respect to strategy.

The methodological approach INSTAL consists of three steps:

- (1) Diagnosis of strategic alignment.
- (2) Discovery and analysis of requirements evolution.
- (3) Propagation et validation des exigences d'évolution

Limits:

The method takes into consideration the INSTALL strategic level in representing the strategic alignment but impractical because it uses formalizes card that does not include all elements of the strategic level.

3 COMPARAISON AND EVALUATION OF APPROACHES

In other words, the classical vision of alignment involves two main areas: the area of Business (competitive strategy and activities of the organization) and the field of IT (IT strategy and IS support) that it is to ensure consistency.

The issue of business IT alignment must necessarily pass through the life cycle of alignment: (1) identification of elements that will contribute to the construction of the alignment and (2) the evaluation, and (3) necessary actions to correct this alignment (figure 1).
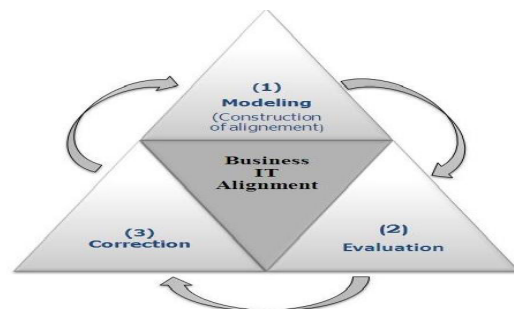

Figure 1: Cycle of strategic alignment.

Our evaluation criteria are related to this cycle of alignment: modeling (alignment entity, modeling language), evaluation and correction of alignment.

Table 1: Comparative table of the approaches of strategic alignment.

Study / Criterion	Luftman 2000	Zachman 2003	Bodhuin 2004	Bleinstein 2005	Wegmann 2005	Etien 2006	Longépé 2006	Gordijn 2006	Thevenet 2009
Alignment entity	strategy/ IT	Enterprise strategy& IT BP, System, environment, organisation, architecture.	Business process/ IS	Strategy/ Business Process	Environment/ Business process	Business process/IS	Strategy/ IS	Straategy/business Process , IT	strategy/ (business process, IS)
Modelling levels	---	---	functional	strategy	functional	functional	functional	Strategy/functional	Strategy/functional
Construction of alignment	—	___	Top-Down	Top-Down	Top-Down	Top-Down	Top-Down	Top-Down	Top-Down
Modelling	--	Artifact classification	---	Goals modeling (I*)	---	Ontology	---	Goals modeling/ Business Model	card formalism
Evaluation of alignment	No	No	yes	No	No	yes	NO	NO	yes

Alignment Entity. As the table shows it, the majority of the approaches of alignment connect 3 entities at the maximum only the approach of (Zachman, 1987) has seven entities.

In the whole of these approaches, alignment passes between a pair of entities. (Luftman, 2000) is interested in the alignment of enterprise strategies and IT strategies. (Wegmann, 2005) in alignment between the system, the processes and the environment, (Thevenet et al., 2009) alignment between the couple strategy of the company/business process, information system.

Modeling. The modeling or the documentation of alignment is based on the modeling of the objectives for (Wegmann, 2005), while (Etien, 2006) uses the intentional approach based on ontology of WWB. (Zachman, 1987) uses a modeling based on a matrix according to 6 prospects and 6 aspects.

Evaluation. (Wegmann, 2005) proposes an approach of evaluation which rests on interpretation, judgment. These are the interpretations which make it possible to show if there is alignment or not without evaluating a degree of this alignment. Other approaches propose criteria of evaluation associated with quantitative measurements. For example, to count to accounting) the number of activities dealt with by the system (Etien, 2006; Etien and Salinesi, 2005).

Correction. (correction method used) several approaches were interested in the correction of strategic alignment. For example (Etien, 2006;

Thevenet, 2009) are based on the results of the evaluation of alignment to define the evolutions to be implemented. The correction is done step by step by evaluating alignment after each change (Etien, 2006). In all these approaches, actions proposed for the corrections are very difficult to implement and very poor at detail provided.

4 CONCLUSIONS

This paper presents a state of art and a comparison between some approaches of alignment. The objective is then to propose a model for representation of the alignment that takes into account three entities: enterprise strategy, business processes and information system.

We consider that the strategic level defines the intentions of the enterprise. Its implementation is done through the conduct of business processes and thus the treatment of strategic alignment between business strategy and information system does can be done without going through the business processes that support enterprise activities.

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