A Critical Review of Luftman's Instrument for Business-IT Alignment

Fernando Belfo  
Algoritmi Research Centre, University of Minho and Polytechnic Institute of Coimbra, fpbelfo@gmail.com

Rui Dinis Sousa  
University of Minho, rds@dsi.uminho.pt

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A CRITICAL REVIEW OF LUFTMAN´S INSTRUMENT FOR BUSINESS-IT ALIGNMENT

Belfo, Fernando Paulo, Algoritmi Research Centre, University of Minho and Polytechnic Institute of Coimbra, Coimbra, Portugal, fpbelfo@gmail.com
Sousa, Rui Dinis, Algoritmi Research Centre and Information Systems Department, University of Minho, Portugal, rds@dsi.uminho.pt

Abstract

Business and Information Technology alignment (BIA) remains one of the most important issues among IT managers. The assessment of Business and Information Technology Alignment (BIA) has been viewed by different rationales in the literature.

This paper reviews the most important literature about BIA, identifying the alignment assessment approaches under the lenses provided by Luftman alignment measurement instrument. Several significant alignment studies are analyzed, presenting their research approach, the dimensions of the alignment and the unit of analysis employed at each study. Then, an assessment how well these various works on Business/IT-alignment cover individual dimensions of the Luftman framework is made.

One of the main finding was that most of the approaches focus were on the strategic level. Also, from these studies, the alignment between business and IT may vary from a simpler view, with a single and indirect computation way, to a more complex approach sustained by Luftman, with quite a few dimensions, identified as communication, competency/value measurements, governance, partnership, technology scope and skills.

This work contributes for a better understanding of the findings regarding Luftman instrument validation. Implications for future research are discussed.

Keywords: business and IT alignment, alignment approaches, alignment dimensions, instrument validity.
INTRODUCTION

Over the past years, IT managers have been concerned with Business and IT alignment (BIA) under the expectation that achieving alignment could positively influence business performance (Bergeron & Raymond & Rivard 2004, Chan & Huff & Barclay & Copeland 1997, Chan & Sabherwal & Thatcher 2006, Cragg & King & Hussin 2002, Kearns & Lederer 2003, Sabherwal & Chan 2001). A regular annual survey of U.S.-based organizations has ranked BIA in the top 10 concerns for many years in a row, moving it from the third in 2010 back to the first top concern in 2011 (Luftman & Ben-Zvi 2011).

Terms such as "strategic alignment" (Chan et al., 2006; Henderson & Venkatraman, 1993), "strategic fit" or "functional integration" (Henderson & Venkatraman, 1999) and "information systems alignment" (Benbya & McKelvey, 2006) or "IT alignment" (Chan & Reich, 2007; Henderson & Venkatraman, 1993) have been used regarding BIA. Reich and Benbasat (1996) have seen it as a measure of how much "the mission, objectives and plans of IT support and are supported by the mission, objectives and business plans". However, rather than a bivariate conceptualization of alignment between business and IT, looking into just one alignment type, the complex and interrelated nature of the relationships between constructs requires a holistic approach (Bergeron, et al. 2004, Chan, et al. 1997).

The Luftman’s (2003) approach to measure alignment is one of the most cited (more than 400 citations at Google Scholar) taking into account diverse alignment criteria or maturity categories: Communications, Competency/Value Measurements, Governance, Partnership, Technology Scope and Skills. Using a survey instrument to determine a category score for each of the six criteria by evaluating 38 alignment practices from level 1 to 5, an overall alignment score is then determined, what can be used as a benchmarking tool.

This work intends to do a critical review of Luftman’s instrument by comparing it with other relevant proposals in the literature for assessing business-IT alignment.

RESEARCH APPROACH

In order to identify relevant instruments for BIA in the literature, first, an initial set of keywords to search references related to the subject were identified: "business", "information", "technology" and "alignment". Second, under the rule that those keywords should be part of the reference title, a search was performed using the Google Scholar engine. Third, the results from the previous search were checked against the survey instruments already identified in two repositories, the Calgary Surveys Query System (CSQS) and the "Survey Instruments in IS" (Newsted & Munro & Schwarz 2012). Forth, to confront with Luftman instrument, six instruments were selected from the most cited references as presented in Table 1.

The most used research approach was the survey. Alignment instruments usually capture the perceptions of a single key informant in each organization. It is argued that the way managers perceive their environment is more significant than other measures, like archival data (Kearns & Lederer 2003, Segars & Grover & Teng 1998). Yet, sometimes, when there are specific constructs, it may valuable to use more than one key informant at each organization (Chan, et al. 1997).

The majority of alignment instruments assess the alignment at a strategic level. At the tactical level, we selected Reich and Benbasat (2000)’s instrument. For the alignment at the operational level, studies show a much lower level of citation than the selected references and thus did not manage to be included in this work (Cragg & Tagliavini & Mills 2007).
Table 1. Selected business and IT alignment instruments.

This paper is divided into four more sections. Next session describes the alignment dimensions as well as the sub-dimensions used in the Luftman survey instrument. The following section presents the features of the selected and studied instruments. The following section presents a short review and critique in what concerns validity of studies that used Luftman instrument. Finally, the paper ends with some conclusions, some implications for practice and proposals of future research work.

3 DIMENSIONS OF BUSINESS-IT ALIGNMENT

Whether it is called dimension, criterion, category, domain, factor, antecedent, enabler or inhibitor, it is relatively consensual that business and IT alignment has many facets. Some authors theorized about those dimensions, underlining the importance of functional integration of business domain with the IT domain. Others calls for the fit of the strategic level of business or IT with their correspondent operational levels (Henderson & Venkatraman 1999). Several factors which can influence the alignment have been, not only argued theoretically, but also tested (Luftman & Papp & Brier 1999, Reich & Benbasat 1996, Reich & Benbasat 2000). In this section, taking a wider perspective on alignment, considering that it is something complex and multifaceted, we briefly introduce the most important dimensions for BAI under Luftman’s lenses.

3.1 Communications

Communication implies the transmission of information. However, in addition to the transmission of information, there still exists a need for a mutual understanding of those who communicate. According to a Luftman multi-year study, with data obtained from business and information technology executives from over 500 firms representing 15 industries, "good IT/business communication" appears as one of the enablers to alignment and "IT does not communicate well" or "IT/non-IT lack close relationship" as one of its inhibitors (Luftman, et al. 1999).

Luftman (2003) instrument considers six criteria about communications: "understanding of business by IT", "understanding of IT by business", "organizational learning", "style and ease of access", "leveraging intellectual assets" and "IT–business liaison staff". Each criterion has five possible levels
of assessment. For example, the criterion described as the "understanding of business by IT" range from level 1, which means "IT management lacks understanding", through the third level, which means "limited understanding by IT management", up to level 5, which means "understanding required of all IT staff" (Luftman 2003). These six criteria deal mainly with knowledge and its management.

3.2 Competency/Value Measurements

The different languages usually used by business and IT complicate their communication and mutual understanding. For this reason, it is important that IT professionals can demonstrate the value of their work and propose projects in a way that the business can understand. The agreement about service levels of the IT department to the business is a way to define and measure the desired support and service. Luftman (2003) instrument considers seven criteria about competency and value measurements: "IT metrics", "business metrics", "link between IT and business metrics", "service level agreements", "benchmarking", "formally assess IT investments" and "continuous improvement practices".

Two of the dimensions considered by the instrument used by Kearns and Lederer (2003) also focus on important facets associated with this dimension: the assessment of the IT plan reflection of business plan and the business plan reflection of IT plan.

3.3 Governance

Most strategic alignment issues in the literature are about governance. Luftman instrument considered seven criteria about competency and value measurements: "formal business strategy planning", "formal IT strategy planning", "organizational structure", "reporting relationships", "how IT is budgeted", "rationale for IT spending", "senior-level IT steering committee" and "how projects are prioritized". Each criterion has also five possible levels of assessment. For example, the criterion described as the "formal business strategy planning" range from level 1, which means "not done, or done as needed", through the third level, which means "some IT input and cross-functional planning", up to level 5, which means "with IT and partners" (Luftman 2003).

Other authors also underline the importance of measuring specific governance facets of alignment. For instance, the level of CIO participation in business plan or CEO participation in IT plan, and consequently, the assessment of the IT plan reflection of business plan and the business plan reflection of IT plan (Kearns & Lederer 2003). Also, the profile of business strategy and its compatibility (or not) with IT strategy profile seems to represent another important aspect of alignment (Sabherwal & Chan 2001).

3.4 Partnership

Luftman (2003) found that the relationship that exists between the business and IT organizations is another criterion that ranks high among the enablers and inhibitors of alignment. Aspects like the opportunity to have an equal role in defining business strategies, trust developed among the participants, or the sharing of risks and rewards are considered significant. Luftman instrument considered six criteria about partnership: "business perception of IT", "IT’s role in strategic business planning", "shared risks and rewards", "managing the IT–business relationship", "relationship/trust style" and "business sponsors/champions".

3.5 Technology Scope

According to Luftman, technology scope criteria measure the degree to which IT is able to go beyond the back office and the front office, to assume a role supporting a flexible and transparent infrastructure for all, to evaluate and apply emerging technologies successfully, to enable or drive business processes and strategies and to provide solutions customizable to client needs.
Technology Scope includes four criteria: "primary systems", "standards", "architectural integration" and "how IT infrastructure is perceived".

3.6 Skills

Luftman vision about skills dimension of alignment includes seven criteria: "innovative, entrepreneurial environment", "key IT HR decisions" made by appropriated people, "change readiness", "career crossover opportunities", "cross-functional training and job rotation", "social interaction" and "attract and retain top talent". According to Luftman, this dimension "encompasses all IT human resource considerations, such as how to hire and fire, motivate, train and educate, and culture".

4 ASSESSMENT APPROACHES OF BUSINESS AND IT ALIGNMENT

Luftman research about business and IT alignment is well recognized among academics and practitioners (Luftman 2000, 2003, Luftman & Kempaiah 2007, Luftman, et al. 1999). As mentioned before, Luftman instrument, comprised of six dimensions and 38 items, takes into account a considerable number of facets. However, it is hardly difficult if not impossible to capture all the facets for complex constructs. Nevertheless, Luftman instrument seems to provide a strong coverage of important dimensions except for the technology scope. Although reasonably well covered, the technology scope dimension does not address how IT projects serve specific organizations objectives as it happen in the Sabherwal and Chan (2001) instrument.

Table 2 summarizes the analysis of each selected instrument on each dimension of Luftman instrument.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Communications</th>
<th>Competency/Value Measurements</th>
<th>Governance</th>
<th>Partnership</th>
<th>Technology Scope</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luftman</td>
<td>2003</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Chan, Huff, Barclay &amp; Copeland</td>
<td>1997</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Reich &amp; Benbasat</td>
<td>2000</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sabherwal &amp; Chan</td>
<td>2001</td>
<td>1</td>
<td>1</td>
<td>4</td>
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<td>4</td>
<td>1</td>
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<tr>
<td>Kearns &amp; Lederer</td>
<td>2003</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Segars &amp; Groover</td>
<td>1999</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cragg, King &amp; Hussin</td>
<td>2002</td>
<td>1</td>
<td>1</td>
<td>4</td>
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<td>1</td>
</tr>
</tbody>
</table>

Table 2. Degree of coverage of Luftman dimensions by alignment instruments

For each instrument, the degree of coverage of the six dimensions was measured using a five point scale: 1 as "not covered"; 2 as "weakly covered"; 3 as "moderately covered"; 4 as "well covered" and 5 as "strongly covered".

4.1 Chan, Huff, Barclay and Copeland (1997)

This is one of the most cited references for BIA in the literature. This work evaluated the use of two approaches to measure alignment; a holistic, ‘systems’ approach and a dimension-specific, “bivariate”
approach. First, four constructs were developed: realized business strategy, realized IT strategy, IS effectiveness and business performance. The first two of these four constructs were directly linked to the alignment construct. Each of the two constructs (realized business and IT strategies) had eight dimensions, evaluating parallel aspects of the strategies. For instance, for the "strategic orientation of business" construct, the dimension "company aggressiveness" addressed the "push to dominate (i.e. increase the market share)". On the other hand, for the "strategic orientation of the existing portfolio of IS applications or realized IT strategy" construct, the dimension "IT support for aggressiveness" addressed the "IS deployments used by the business unit when pursuing aggressive marketplace action" (Chan, et al. 1997). The holistic, ‘systems’ approach assessed alignment based on specific dimensions of strategic alignment (eight strategies dimensions). The dimension-specific, bivariate approach assessed alignment based on a single (and aggregate) dimension of both strategies (business and IT). A moderation approach, understood as a weighted overall conceptualization of alignment, revealed better assessment of IT alignment and has been recommended under a systems perspective.

Chan et al. (1997) instrument covers well the criteria considered in the governance dimension of the Luftman instrument. It provides also a good coverage of technology scope criteria. When strategic orientation of the existing portfolio of IS applications has been done, it is necessary to make particular evaluations of IS developments used by business unit to support a particular business strategy as it is the case of IS deployments used "to facilitate creativity and exploration". The other dimensions; communications, competency/value measurements, partnership and skills are not covered by this instrument.

4.2 Reich & Benbasat (2000)

This is another often cited reference in the literature. The main objective of the paper is to analyze factors influencing the social dimension of alignment between business and information technology objectives. Before these authors adopted the term "alignment" (Reich & Benbasat 2000), they used the term "linkage" between business and IT (Reich & Benbasat 1996). According to their studies, the alignment construct has two dimensions: the intellectual dimension, concerned with the internal consistency and external validity, and the social dimension, covering the mutual understanding of objectives and plans among business and IT executives. They focused their investigation on the social dimension of alignment. Alignment was divided into two perspectives: short term and long term alignment. In addition to proposing that alignment instrument, these authors and others, have applied it in some case studies (Hartung & Reich & Benbasat 2000, Reich & Benbasat 1996).

The proposed model included four factors that could influence alignment: shared domain knowledge between business and IT executives, IT implementation success, communication between business and IT executives, and connections between business and IT planning processes. A new factor, strategic business plans, was found to influence both short and long-term alignment. Although these authors considered these aspects as factors that could influence alignment, others considered these as criteria of alignment itself (Luftman 2003). The factors proposed by Reich and Benbasat (2000) covered well the criteria in the communications and governance dimensions of the Luftman instrument. A moderate coverage of competency/value and partnership criteria was provided, especially because of "connections between business and IT planning processes" but missed the criteria for technology scope and skills dimensions.

4.3 Sabherwal and Chan (2001)

Sabherwal and Chan (2001), instead of measuring specific alignment indicators, use an indirect computation process to assess alignment. The approach measures BIA through the proximity of the actual business or IT strategy to the expected business or IT strategy. Also, the expected business or IT strategy depends on the detected strategy profile, which can be defender, prospector or analyzer (Sabherwal & Chan 2001). Under that proposal, "IS for efficiency", "IS for flexibility" and "IS
covered" are IT strategies that are believed to be better aligned, respectively, with profiles of defender, prospector and analyzer of business strategies.

In terms of considered dimensions, the approach proposed by Sabherwal and Chan (2001) is similar to the one proposed by Chan et al. (1997). Accordingly, governance and technology scope are well considered dimensions. The governance criteria link to strategy definition, either the business strategy (defensiveness, analysis, risk aversion, proactiveness, futurity, aggressiveness) or the IT strategy (operational support systems, interorganizational systems, market information systems or strategic decision support systems). Technology scope dimension is well covered in this instrument since it forces an assessment of the development consequences in each kind of systems, like the improvement of day-to-day operations efficiency or the enhancement of the ability to negotiate with customers. This instrument does not cover the other dimensions: communications, competency/value measurements, partnership and skills.

4.4 Kearns and Lederer (2003)

The instrument used by Kearns and Lederer (2003) to measure alignment considered four dimensions: the level of CIO participation in the business plan, the level of CEO participation in the IT plan, the assessment of the IT plan reflection of business plan and the business plan reflection of IT plan (Kearns & Lederer 2003). Authors stated that the first two dimensions could affect the last two. Among instruments analyzed, this is the only one that models the BIA with four constructs with relations of dependency among each other.

These four constructs make a good coverage of the governance dimension since they provide an evaluation of several aspects of the strategic planning process, specially the final objective of having the IT plan reflecting the business plan and vice-versa. For the CEO participation in IT planning, an item asks for an evaluation of "the CEO regards spending on IS as strategic investments rather than expenses to be controlled". This item links with the Luftman item of governance described as "how IT is budgeted". The constructs "level of CIO participation in business plan" and the "level of CEO participation in IT plan" provide a moderate coverage of the communication and partnership dimensions. Although these constructs relate to the communication dimension, they do not approach adequately some facets in the Luftman instrument such as "organizational learning", "style and ease of access", "leveraging intellectual assets" or "IT–business liaison staff". Also, although items like "business perception of IT" and "IT’s role in strategic business planning" are considered in this instrument, others like "shared risks and rewards" are ignored. The technology scope dimension is slightly covered, in particular when using "the business plan refers to specific IS applications".

4.5 Segars and Groover (1999)

The research of these authors wanted to detect distinctive organization profiles when planning strategic information systems. It uses particular measures of planning effectiveness, namely the "planning alignment" dimension, with eight items concerning BAI.

The factors proposed by Segars and Groover (1999) covered well the criteria considered in the governance dimension of the Luftman instrument. The instrument has a low coverage of communications, competency/value and partnership measurements criteria. It completely lacks the criteria about technology scope and skills dimensions. Its strength lies on its simplicity. One weakness consists on its strict orientation on the governance perspective of alignment (3 items). Nevertheless, it also has some items which smoothly belong to the dimensions of communications, competency/value measurements and partnership.

4.6 Cragg, King & Hussin (2002)

This study uses an approach similar to Chan et al. (1997) to assess BIA. Alignment is seen as the fit between business strategy and IT strategy. Nine items are used to assess each one of the strategies.
Alignment was modelled following two approaches: fit as ‘matching’ and fit as ‘moderation’. Fit as matching was computed based on the difference between each of the two pairs of each of the nine strategies. Fit as moderation was modelled as the interaction between each business strategy and the related IT strategy. For each of the nine strategies, instead of the absolute difference, it was computed the product of the business strategy score and the corresponding IT strategy score (Cragg, et al. 2002).

In a similar manner to the approach of Chan et al. (1997), and by the same reasons, this alignment instrument covers well the criterion considered in the governance and technology scope dimensions. The remaining dimensions, communications, competency/value measurements, partnership and skills are not covered by this instrument.

5 LUFTMAN INSTRUMENT VALIDATION

Management Information Systems (MIS) researchers need to validate their research instruments. In 1989, Straub was pointing out that instruments in the MIS literature were insufficiently validated. So, he put forward some of the basic principles for validating an instrument. He asserted that an instrument validation should consider some types of validity like content validity, construct validity, reliability, internal validity, statistical and conclusion validity (Straub 1989). Although the field has progressed significantly, it seems that the majority of published studies continue not having acceptable validated instruments (Boudreau & Gefen & Straub 2001). Therefore, a list of “mandatory”, “highly recommended” and “optional, but recommended” validities have been suggested, while presenting and explaining the validity components and related techniques and heuristics (Straub & Boudreau & Gefen 2004).

Regarding the measurement of alignment, and until recently, some authors have argued that there was no validated instrument for this measurement (Sledgianowski & Luftman & Reilly 2008). This paper does not intend to do an exhaustive validation analysis of the Luftman instrument. Nevertheless, it presents a short review and critique about the work that has been done.

The content validity verifies if the instrument measures cover all possible measures of the properties under investigation. It is virtually impossible to create an instrument with a complete coverage of those properties since the universe of possibilities is almost unlimited. And perhaps, its verification is even more difficult. In terms of content validity, an important research was made by Luftman which latter supported the proposal of his alignment instrument. The paper “Enablers and Inhibitors of Business-IT Alignment” provided insights into identifying areas that help or hinder business-IT alignment (Luftman, et al. 1999). Business and information technology executives (1,051) from over 500 firms of the US Fortune 1,000, representing 15 industries who attended classes addressing alignment at IBM’s Advanced Business Institute, were asked to describe those activities that assist in achieving alignment and those which seem to hinder it. This multi-year study, conducted from 1992 to 1997, determined the most important enablers and inhibitors to alignment, represented an excellent content validity because of not only the number of the managers asked but also the variety of its sectors provenience and its long period of time. However, it can always be said that the type of respondents were limited to large companies and so, other alignment factors could emerge if other type of managers were consulted. Also, this study was responded only by managers and it could be argued that it could include other respondents in the organization or outside the organization (e.g. academics).

Sledgianowski et al. (2008) research conducted a pilot test administered to 23 IT and business executives within one organization, revealing that, according to these authors, all items were interpreted as intended. No changes to the final questionnaire were made, which was then used to survey 153 IT and business executives from 11 business units across eight organizations. Confirmatory factor analysis was used to evaluate the instrument. Authors proposed a second alternative SAM model, with a shorter variable set, reducing the number of items 39 to 22. The second
model was a more parsimonious model of SAM. According to authors, statistical evidence provided the support of the goodness-of-fit of the SAM framework.

Although the alignment construct was measured in a different way, a recent research used the Luftman instrument to study the relationships between the maturity constructs and the alignment itself. The study surveyed 130 business and IT executives from 22 companies in China (Chen 2010). All variables presented adequate composite reliability showing high internal reliability for the measures. This research also evidenced that, in this particular Chinese context, it was possible a significant improvement of the instrument when reducing the number of items from 39 to 21. Except for the skills, every dimension revealed a positive influence on alignment.

The instrument was found to have acceptable goodness-of-fit in these researches. These studies seem to provide some support for the use of the Luftman instrument could measure business–IT alignment. However, not all mandatory or recommended validities and correspondent techniques were performed (Straub, et al. 2004). New studies are required for stronger validation.

6 CONCLUSIONS AND IMPLICATIONS FOR FUTURE

The Luftman (2003) approach to measure alignment is one of the most cited instruments. Chan, Huff, Barclay & Copeland (1997), Reich & Benbasat (2000), Sabherwal & Chan (2001) seem to be the other most important alignment assessment instruments, if we take the number of citations (more than 400 at Google Scholar) as an indicator of their popularity among the academic community.

The revision made evidences that most of the studies approaches focus on the strategic level. From those, the only different approach is the Reich & Benbasat (2000) instrument with a tactical level approach. None of these instruments have an operational level approach, an IT level perspective at the project level.

Following Luftman lenses, the analysis of the dimensions providing a degree of coverage is somehow subjective. Our classification for the communications dimension coverage of each instrument revealed that, besides a strong coverage by Luftman instrument, it was well covered by Reich & Benbasat (2000) instrument and moderately covered by Kearns & Lederer (2003) instrument. Governance was the dimension better covered by all instruments. The second best covered dimension was the technology scope. Luftman approach may improve this dimension by evaluating the direct contribution of systems to business objectives. Apart from Luftman (2003) approach, the other analyzed instruments do not consider the skills dimension. Partnership and competency/value measurements dimensions were poorly covered in the other instruments.

The majority of published studies continue not having acceptable validated instruments (Boudreau, et al. 2001) and alignment instruments are not an exception (Sledgianowski, et al. 2008). Since Luftman's instrument is one of the most promising instruments and has been showing acceptable validity for some components, it deserves further attention and use in future research for the remaining mandatory validity components (Straub, et. al. 2004).
References


