Business-IT Alignment in the Digital Age, an Empirical Analysis

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Abstract

After the emergence of concepts such as digital transformation, digitalization, digital strategies, among other related terms, Business IT alignment seems to have lost its prominence as one of the most important concerns of the organizations, in terms of IT administration. This paper postulates that strategic alignment initiatives continue to have the same relevance indicated by the innumerable written documents on this topic, and that transformation initiatives should consider the strategic alignment between the business and the IT function as a prerequisite before conducting these kinds of implementations. Misalignment between the business and the IT will limit the chances of success of such initiatives. Therefore, the persistent relevance and the need to measure it with updated instruments capable of measuring the degree of maturity reached and feeding back to the organization remains a key topic in IT administration. Based on an updated instrument, a study was conducted to measure the strategic alignment degree between business and IT, applied to a sample of mostly large companies in Chile.

Keywords: Business-IT alignment, maturity alignment level, updated model

1. Introduction

Within a turbulent digital scenario, companies in all industries are facing the decision of innovation or extinction. Digital transformation, digital strategies, digitalization, among other related terms are changing the business models and processes, as they have traditionally been known and applied. The digital revolution has changed the rules of business. With the constant diffusion of new digital technologies, each industry faces its own challenges and threats. New players enter the market, leveraged by cutting-edge technology that shakes up solid and recognized companies. (Bharadwaj et al., 2013; Rogers, 2016; Venkatraman, 2017).

To be successful in the digital world, companies must think of technology not only as a support function, but also as a strategic and competitive weapon, so it is not about applying technology to the business as a commodity, but rather creating new business models and operational models, leveraged by innovative uses of technology. When raising this point, it is assumed that the concept of business IT alignment is still valid as it was in the past, even in this new digital environment, which means organizations continue to spend a significant amount of their time trying to align the IT function with operational areas, instead of looking for innovative ways of doing business. For this reason the business-IT alignment issue continues to be an unresolved problem. And while, for a long time, IT has been treated as subordinate to the commercial strategy, in light of the bibliographic review conducted, we coincide with corporate executives and researchers emphasizing the importance of the alignment between business and IT, and the value that it brings to the organizations. Even though the number of papers published on strategic alignment between business and IT has declined markedly since the appearance of the Digital Transformation concept, some authors continue to reveal the benefits it generates for organizations, with new approaches or extensions of the traditional concept. (CIO Wiki, 2019; Horlach et al., 2016; Tejada-Malaspina & Un Jan, 2019; Wan & Ge, 2018).

The need for a strategic alignment between the business and IT is vital for the functional areas and IT departments to work together and reach mutual understanding. This understanding means that both functional areas and IT must be partners in the development and execution of the organizational business strategy, recognizing that IT and business strategy are so closely related, that companies cannot be competitive if both strategies are not strongly linked and aligned. (Aversano et al., 2016; Avison et al., 2004; Chan et al., 2006; Coltman et al., 2015; Duffy, 2001; Johnson & Lederer, 2010; Luftman et al., 2015).

Understanding the implications of this alignment for the success of the organizations in this digital environment, the question that justifies this research is: what is the degree of strategic alignment achieved between the business and the IT function, in companies operating in Chile? In order to answer the research question, the authors analyzed seminal papers and models, as well as applied research articles, identifying opportunities

for improvement, with the purpose of contributing to this work, and ultimately contributed an updated model for measuring the business-IT alignment maturity level and applied it to Chilean companies.

2. Literature Review

2.1 The Business-IT Alignment Concept

More than 30 years of studies have consistently indicated that in companies, the alignment of information technology with the business continuous to be an unsolved problem. As it is commented by Luftman et al. (2015), there is agreement that significant progress has been made in understanding the factors that can produce an effective alignment; however, research on IT alignment with the business continues to have several problems. First, most alignment models approach alignment as a static relationship, without considering it to be a dynamic, constantly changing process. Second, most alignment models are not based on solid theoretical foundations, and third, because of their static vision, these models do not guide organizations on how to improve in that process. In summary, despite the existing awareness about the need for alignment, and the evidence documented in academic and professional publications, companies spend most of their time aligning the IT services and operations with corporate objectives instead of figuring out innovations and business performance improvements. (IT Web Brainstorm CIO Survey, 2014; Peppard & Ward, 2016). The latter could indicate that the concept of strategic alignment between business and IT is not completely solved, but still managed at the operational level. In that sense: *"The challenge is, as it has always been, to harness these technologies in support of enterprise objectives and to create new strategies"*. (Peppard & Ward, 2016, p.16). In other words, to harness digital technologies for achieving alignment with enterprise objectives and co-creating innovative strategies and new business capabilities.

In order to contextualize this research and its objectives, an extensive literature review was conducted on the concept of business and IT alignment, from its origins to the present.

By tracing a timeline in the theoretical evolution of this topic, we can see how the concept of Business IT alignment began to acquire general interest since the mid-1980s, based on the works of Benjamin, Scott-Morton & Wyman (1983), Scott-Morton & Rockart (1984), McFarlan (1984), Wiseman & MacMillan (1984), among others, however, it was Scott-Morton who gave the initial impulse to this new field of academic interest. As described by Coltman et al. (2015), research on the strategic alignment of IT and its relationship with business strategy emerged in the 80s as part of the *"MIT90s"* project, led by Michael Scott-Morton at the Information Systems Research Center (CISR) at MIT.

Since the end of that decade, this topic began to be strongly promoted by new researchers who fed this new body of knowledge. (Chan et al., 1997; Henderson & Venkatraman, 1990; Henderson & Venkatraman, 1993; Lederer & Mendelow, 1989; Luftman et al., 1993; Venkatraman, 1989; Venkatraman et al., 1993), to name just a few of the seminal works. Of all of them, Henderson and Venkatraman were the ones that achieved greater notoriety in the academic community, with the proposal of the SAM framework – *Strategic Alignment Model*, which is cited in most of the research that refers to the concept of Business IT alignment, and for much of later publications. At that time, academics and company managers made a call to scholars to think about the conditions under which the IT strategy should support the business strategy, so that IT becomes a facilitator and co-participates in the formulation of the business strategy.

Bughin et al. (2018), more than 30 years later - now in a more technologically turbulent and dynamic environment - reinforce the need for a comprehensive vision of the organization, which translates into the need for this alignment. In this regard, they point out that when talking to business leaders about what they understand by digitalization, some see it as the improved version of what the IT function does in the organization, others focus on digital marketing or sales, but very few have a broad and holistic vision of what a digital proposal really means.

2.2 Business IT-Alignment as Prerequisite for Success in the Digital Age

In reference to the most recent rise of digital transformation processes, we have witnessed renowned failures where more than two thirds of these processes fail or do not reach the potential, given the investments made. (Baculard et al., 2017; Remes et al., 2018; Walker, 2017). Regarding this, Davenport & Westerman (2018), indicate that such initiatives do not end well, in part because digital is not just something that can be bought and connected to the organization. This is a multidimensional process, which not only involves technology, but is a continuously changing process that affects the way of doing business.

2.3 Measuring the Business-IT Alignment Level

The updated model, presented in the next section, has its origin in the widely recognized SAMM framework – *Strategic Alignment Maturity Model*, (Luftman, 2000), and subsequent publications. SAMM considers a total of six components or dimensions, as constructs in its structure: 1) Communications, 2) Measurement of the competence and value of IT, 3) IT Governance, 4) Partnership between the IT and business, 5) Scope and architecture of the IT infrastructure, and 6) Skills. The instrument that operationalized the model consists of a questionnaire with 39 questions, distributed in

the six dimensions indicated. Each question has 5 possible answers, from which the interviewee chooses the most representative. The model postulates that alignment between the business and IT is the result of these six dimensions acting together, which in turn has a positive impact on the performance of the company, while none of these dimensions acting separately has such an effect. According to this, each dimension presents the hypotheses of positive impact on Business and IT alignment. Ultimately, SAMM proposes that there are five levels of maturity that a company can reach.

Based on this model, the authors propose an improved model, which is applied in this work, echoing Luftman's words, when he points out that efficient tools are required with the capacity to provide useful and updated information to the organization in those aspects that should improve - under the context of a collaborative work between business and IT. In their own words: "*A tool that can provide both a descriptive assessment and a prescriptive roadmap on how to improve*". (Luftman & Kempaiah, 2007, p.167). And although, SAMM has been an effective instrument to measure and align IT, it needs to be updated in order to more efficiently capture the state of maturity of the strategic alignment in the current scenario.

2.4 The Updated Model

Having reviewed the fundamentals of SAMM, the constructs that compose it, and the instruments that operationalize it, the authors considered that, in the scenario with large-scale digital transformations, the model needs to be improved to adequately capture such changes. In order to identify precisely how it needed to be improved, it was necessary to place SAMM in a digital context, which required constructing a new model under which it could operate, demonstrating its capabilities to function in a digital scenario.

After reviewing the most recent literature about digital transformation and related concepts, the authors concluded that there are three key digital pillars that companies must possess to be successful on the path to becoming a digitalized company, which are: 1) Building digital capabilities, 2) Building an innovative organizational culture, and 3) Strong leaderships and shared vision. (Herbert, 2017; Sacolick, 2017; Venkatraman, 2017; Vial, 2019; Weill & Woerner, 2013; Westerman et al., 2014). Upon reaching this conclusion, the authors built a digital framework under which the updated model could operate. When confronting the reference model with this digital framework several gaps appear. For more details regarding the digital framework proposed by the authors, please refer to the work of Gajardo & La Paz, 2019

Four aspects considered critical for a tool whose purpose is to measure the business-IT alignment level in this new environment, that in turn fill in the gaps previously mentioned, where found to be absent. These aspect, are 1) Engagement of the personnel and its contribution to the organizational goals and objectives, 2) Innovation as an engine for the future of any organization, 3) A rewards systems in concordance with an innovation culture, and 4) The necessary planning of the information systems, in a collaborative work, involving the whole organization.

Upon identifying these four absent aspects, necessary changes were made to the reference model. In summary the updated model maintains the first 5 dimensions of the reference model, replacing the sixth dimension "skills", for a new dimension called "People", which covers the first absent aspect. Also, three new dimensions are added: "Innovation" and "Rewards", covering the second and third absent aspects, and "Strategic planning of information, covering the fourth absent aspect. For more details regarding the updated model proposed by the authors, please refer to the work of Gajardo & La Paz, 2019

These four new dimensions are considered key in this new scenario, when a business alignment maturity process is carried out. Figure N° 1 illustrates the updated model, with the 9 dimensions that it considers.

In reference to the way in which the questions are formulated in the new instrument, that operationalizes the updated model, it was decided to propose a simpler and easier to understand structure for the interviewee, noticeably different from the structure of the reference model. Validity and reliability tests were applied to this new construct, obtaining favorable results in both evaluations. More details on the results of these evaluations are presented in section 4.2 of this work.

Finally, in regards to the levels of maturity that each company can reach, the authors maintain the original 5 levels proposed by SAMM.

From now on, we will refer to the SAMM model as the reference model, or as the original model, interchangeably.

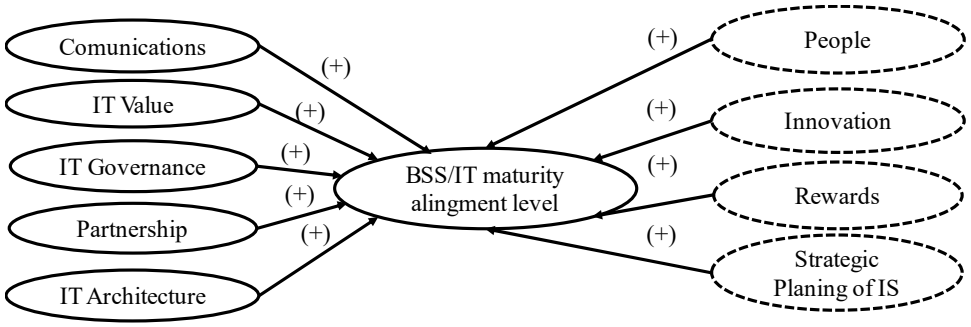

Figure 1: Updated Model

3. Research Methodology

3.1 General Aspects

An exploratory research was carried out for conducting the investigation. The study considered two phases: 1) Application of the new construct to the pilot sample, 2) In-depth interviews of the same sample, once the questionnaire was completed.

The research was proposed and implemented in a sequence of formal stages, following a traditional approach when testing a new instrument, adhering to the precepts of the scientific method, until arriving at the application of a pilot test of the instrument to a subset of the population of interest, in order to test the updated model in a first "staging". The purpose of applying this sequence was to explore how the model can be operationalized by means of this new instrument, allowing the contextual adjustment and balance of its content and showing a preliminary version of its scope through its results. The exploratory results would give us an advanced look at its wider application to companies, and a first knowledge of potential conclusions about the maturity degree in the strategic alignment of IS.

3.2 Pilot Sample

The pilot sample consisted of 30 interviewees, 15 of them from the IT areas, and 15, from areas related to the business operations, who expressed their opinions regarding the business IT alignment organizational practices. The interviewees came from mostly large and renowned Chilean companies from industries such as non-metallic manufacturing companies, hotels and restaurants, financial intermediation, real estate activities, social and health services, transportation, storage and telecommunications, and companies classified as other activities. The purpose of having two groups of respondents, from IT and operational areas, was to explore differences or similarities of perception in the measurement of maturity of Business-IT alignment, which will enrich the results of the study.

3.3 Data Collection Instruments

Two instruments were used to carry out the investigation, applied during the same interview to the same interviewees. First: A structured questionnaire, whose purpose was to operationalize the updated model. Along with including the dimensions that update the reference model, the questionnaire included important changes in its structure that made it more understandable to the interviewee, and at the same time, easier to apply. The questionnaire consisted of a total of 54 questions, all of them posed as statements, using a 5-level Likert scale for their measurement. Second: A semi-structured instrument, acting as a guide for in-depth interviews, in order to contrast, on the one hand, the results obtained after the subsequent analysis of the new constructs, and, on the other hand, to enrich the investigative process, with new findings, which are not possible to capture with the sole application of a structured questionnaire.

3.4 Treatment of Data According to Each Data Collection Instrument

3.4.1 Questionnaire

In relation to the questionnaire applied, and considering that it corresponds to a new instrument, evaluations were carried out using correlational techniques (Cronbach's Alpha for reliability analysis) and multivariate techniques (Exploratory factor analysis for validity test, based on the principal components analysis - PCA). (Corral, 2009; Meraz & Maldonado, 2015; Morales, 2007).

3.4.2 In-depth interview

With respect to the data collected from the in-depth interviews, the thematic analysis method was chosen, characterized by its flexibility and practicality when analyzing results from unstructured information. This method allowed for the construction of taxonomies according to the criteria of significance inherent to the nature of the research, and to establish the essential ideas that guided this work (Braun & Clarke, 2006; Mieles et al., 2012).

4. Results

4.1 Results Presentation

Once the results of both data collecting instruments were obtained, statistical tables were generated that synthesized all the information collected, with the purpose of having a first approximation to the level of maturity of the alignment between the business and the IT function of the companies

submitted for evaluation. Similarly, with the information from the in-depth interviews it was possible to contrast the results obtained by the new construct, seeking to determine consistency (or lack thereof) between both instruments.

The results of the investigation followed a sequence, such that it allowed obtaining and then evaluating the different sources of information and data provided by them. First, the results of the scores obtained after applying the new questionnaire that operationalized the updated model were tabulated and analyzed, verifying the validity and reliability of the new construct. The scores of this stage - according to the scale of the questionnaire - were between 1 and 5, with 5 being the highest degree of maturity of the alignment between the business and the IT function that could be achieved. Subsequently, the data from the in-depth interviews was analyzed and tabulated, following the phases of the Thematic Analysis. Third, a regrouping of the companies submitted to the study was carried out, according to the score obtained by each one. Finally, with this regrouping by score levels, a combined analysis was made, with the findings of the spontaneous response categorizations of the interviewees and the scores shown by each organization to which they belonged. For each of these analyzes, the separation between IT and non IT executives was maintained.

In summary, the following steps were carried out with the data gotten from the two data collection instruments:

Data gathered from the questionnaire (structured data): 1) Validity and reliability evaluations, 2) Calculation and presentation of preliminary descriptive scores, considering the sample as a whole, 3) Presentation of descriptive scores after regrouping the sample, considering a segmentation criterion.

Data gathered from in-depth interviews (unstructured data): 1) Reduction of individual spontaneous responses in categories, and 2) Characterization of the previous categories, considering their nature (Facilitators or inhibitors in business-IT alignment processes, in order to test for consistency with the literature available).

Combined analysis (structured and unstructured data): Representation of both types of data, with the purpose of finding consistency in both contrasts.

4.2 Validity and Reliability Test

After having tested the new construct, validity and reliability tests were applied. As a result, the evaluation of the construct concluded that the new instrument is stable, showing internal consistency, obtaining a general result of 0.984 (Cronbach alpha index), which leads in the first instance to indicate that the test is reliable in its entirety. Technically, to a high degree the individual differences of the scores are attributable to real differences and not to random measurement error. As a complement to the previous coefficient, a reliability analysis was added to analyze each dimension of the instrument separately, by inquiring about the high overall value obtained. As a result, the coefficients decrease while maintaining a sufficient value to maintain the internal consistency by dimension, which makes it possible to conjecture that the greater overall value in this respect is attributable to the complementation of these dimensions when they are integrated to form the construct.

In the validity test (PCA), six components captured more than 80% of the heterogeneity of the data, representing almost all of the variables. In the same way, a deeper analysis suggested to eliminate five questions from the questionnaire, considering that they do not provide more information to explain the variability of the construct. Tables 1 and 2 summarize the results of the reliability and validity tests.

In reference to the validity test (Table 2), a search for underlying concepts was carried out, with the purpose of explaining the theoretical grouping of questions in these six components suggested by the test. As a conclusion, the authors decided to maintain their original design, considering that the instrument better segments those aspects which it desires to emphasize, by measuring its status and evolution.

Table 1: Cronbach's Alpha Values – Reliability Results

Dimensions	Cronbach Index	N° Elements	Item-test correlations		
			min	Ave	max
Comunications	0.898	6	0.62	0.73	0.81
IT Value	0.937	8	0.63	0.78	0.9
IT Governance	0.932	6	0.73	0.81	0.87
Partnership	0.885	5	0.59	0.73	0.83
IT Architecture	0.850	7	0.49	0.61	0.75
People	0.909	7	0.47	0.73	0.9
Innovation	0.945	5	0.67	0.85	0.93
Rewards	0.887	4	0.63	0.76	0.89
Start. Plann. OfIS	0.946	6	0.76	0.84	0.92

Table 2: Summary of Principal Components Analysis (PCA) – Validity Results

Component (PCA)	Total	% Variance explained	% accumulated	% questions
1	30.151	55.834	55.834	14
2	3.873	7.172	63.006	9
3	3.273	6.062	69.068	10
4	2.663	4.931	73.999	6
5	1.800	3.333	77.332	6
6	1.540	2.853	80.185	4

4.3 Preliminary Descriptive Scores

With favorable results in the validity and reliability evaluations of the new construct, we proceeded to analyze the results of the scores obtained by the interviewees with the new instrument. To carry out this task, scores were calculated at the consolidated level, in the 9 dimensions that compose the construct, adding to the results, the scores of the two groups of interviewees, as well. The first part yielded a weighted average consolidated score - including all dimensions, and all respondents, of 3.22, with significant differences between scores by dimension, innovation and rewards being the weakest. In the separation by groups of interviewees, the average IT score exhibited a higher value, with 3.39, while, for business executives, it was 3.06. Within the dimensions by groups of respondents, an important variability was observed, which was measured through the Standard Deviation - SD (Business Executives) / SD (IT executives) ratio. This ratio was very useful to measure the level of variability of the responses of the interviewees from the Business (BS) and IT areas, subject to the same questions for each dimension of the construct. Table 3 presents a preliminary descriptive summary of the scores obtained for the sample submitted to the pilot test.

Table 3: Summary of Preliminary Descriptive Scores

Dimensions	Weighted averages	Min	Max	Average IT executives (IT)	Average operational areas (BS) executive	(SD BS)/(SD IT)
Comunications	3.33	2.90	3.73	3.59	3.07	1.00
IT Value	3.08	2.60	3.40	3.37	2.80	1.14
IT Governance	3.29	2.97	3.63	3.43	3.16	0.75
Partnership	3.45	3.10	3.70	3.65	3.24	1.23
IT Architecture	3.56	3.07	3.80	3.69	3.43	1.23
People	3.29	2.90	3.50	3.51	3.06	0.43
Innovation	2.95	2.80	3.23	2.88	3.02	1.29
Rewards	2.30	1.87	2.80	2.32	2.28	0.72
Start. Plann. of IS	3.43	3.27	3.67	3.57	3.30	1.57
All Dimensions	**3.22**	**1.87**	**3.80**	**3.39**	**3.06**	**0.83**

As it is possible to appreciate, this first approximation to the results shows important differences of perception between the two groups of informants at the aggregate level, a fact that reveals the practices of the organizations to which they belong. Although such differences are attributable to the heterogeneity of the units of analysis from which the informants come - without including a criterion of segmentation by scores - such as the one applied subsequently, it can be deduced that such differences in perception, at a consolidated level, could be present in companies that operate locally, with the characteristics of the sample evaluated.

Anticipating the subsequent analysis, in reference to the segmentation by companies, it was found that the differences observed at the aggregate level were minimized when grouping companies with high scores vs those with low scores in the application of the construct. That is; the differences between informants from the IT units and informants from the operational units became less important.

4.4 Results from the In-depth Interviews

After this preliminary analysis of the scores, the answers obtained in the application of the semi-structured interview protocol were tabulated, seeking spontaneous answers from the interviewees, which were not possible to obtain by applying the new construct alone. As a result of this phase, the different responses were categorized. After that, the resulting categories were characterized as facilitators or inhibitors of strategic alignment processes between the IT function and the business. In this way, following the expert judgment method, as part of the Thematic Analysis, each time a response was considered as a facilitator in processes of strategic alignment between the business and IT, the symbol (+) was assigned to it, while otherwise, the symbol (-) was assigned. These categorizations and characterizations were carried out separately, both for the responses of IT informants, and for informants coming from functional areas, as is possible to observe in table 4.

Table 4: Facilitating and Inhibitory Categories

Facilitating Categories (+)						Inhibitory categories (-)		
IT executives			Business executives			IT executives	Business executives	
TI-1	TI-8	TI-18	BS-1	BS-12	BS-23	TI-12	BS-2	BS-21
TI-2	TI-9	TI-22	BS-4	BS-13		TI-16	BS-3	BS-22
TI-3	TI-10	TI-23	BS-5	BS-14		TI-17	BS-6	
TI-4	TI-11	TI-24	BS-7	BS-15		TI-19	BS-9	
TI-5	TI-13	TI-25	BS-8	BS-17		TI-20	BS-16	
TI-6	TI-14	TI-26	BS-10	BS-18		TI-21	BS-20	
TI-7	TI-15	TI-27	BS-11	BS-19				

According to the figure above - and following the thematic analysis method - out of 98 spontaneous responses from IT interviewees, 27 categories were identified, 21 of them as enablers in business-IT alignment process, while 6, as inhibitors. In the same way, a total of 86 spontaneous responses were reduced to 23 categories, 15 of them, as enablers in business-IT alignment process, and 8, as inhibitors.

4.5 Regrouping of Companies According to their Scores

Table 5 summarizes the scores of the 9 dimensions of the updated model, establishing a separation between the two groups of companies, 16 of them, with higher levels of alignment between the business and the IT function - group 1 - and the remaining 14, belonging to group 2. This summary also individualizes the scores obtained in each group, both by the IT executives who answered the questionnaire, and by executives from other areas of the organization, in the business classification (BS).

Clearly, it can be seen that, the variability presented before in Table 3 decreases significantly, not only between dimensions, but also between type of executives. This behavior is possible to appreciate for both the scores of group 1, and group 2.

Table 5: Summary of Descriptive Scores after Regrouping

Dimensions	Average scores – Companies group 1			Average scores – Companies group 2			(SD BS)/(SD IT) Group 1
	Group 1 (Whole sample)	Group 1 (IT)	Group 1 (BS)	Group 2 (Whole sample)	Group 2 (IT)	Group 2 (BS)	
Comunications	3.96	4.22	3.65	2.38	2.33	2.40	0.91
IT Value	3.90	4.11	3.62	2.15	2.25	2.08	1.09
IT Governance	4.07	4.08	4.06	2.13	2.13	2.12	0.94
Partnership	4.01	4.02	4.15	2.36	2.65	2.20	1.12
IT Architecture	3.97	4.00	3.93	2.60	2.47	2.60	1.08
People	4.01	4.06	3.93	2.48	2.49	2.48	0.88
Innovation	4.27	4.13	4.50	1.92	1.46	2.35	0.86
Rewards	3.68	3.44	4.00	1.88	1.91	1.85	1.09
Start. Plann. of IS	4.04	4.11	3.96	2.38	2.08	2.55	0.82
All Dimensions	**3.91**	**4.00**	**3.79**	**2.37**	**2.34**	**2.39**	**0.90**

At the same time, it is possible to observe that the ratio (SD BS) / (SD IT), obtained by companies in group 1, is closer to 1 for each dimension, compared to the same calculation shown in Table 3, a fact that indicates that the variability in the responses of the reporting units for this group is smaller. In other words, there would be less discrepancy in how the practices of the organization are perceived from the point of view of each reporting unit, for each of the dimensions evaluated.

In the case of the 4 new dimensions that are incorporated into the updated model, it is possible to see score levels with averages similar to those of the dimensions that were not modified, which provides consistency to the updated model as a whole, with the additional contribution of these 4 new dimensions, filling in the gaps of the original model, proposing in this way a new model for the current time. However, the low score shown by the 8th dimension (rewards), particularly for group 2, is undoubtedly a concern, revealing that this dimension is not well perceived by the two groups of executives, from IT and operational areas as well.

4.6 Combined Analysis

With both analyzes carried out separately, a combined analysis was made. To carry out this task, it was considered appropriate to separate the interviewees in two groups, exclusively according to the scores obtained in the new model, that is, regardless of the type of executive who answered the questionnaire (IT and non IT). As a result, there were two groups of informants, clearly differentiated: 1) those whose companies were above the average of the total score for the entire sample, and 2) those interviewed, whose companies were below the average of the total score. Thus, companies with an average score clearly higher than the average, recorded a score of 3.91 (16 of 30 interviewed), while companies under the average, recorded a

score of 2.37 (14 of 30 interviewed). This separation served as the basis for subsequent analyzes.

Based on the previous separation and the findings of the interview phase, it is possible to conclude, on the one hand, that there is consistency between scores considered high for this analysis, with categories of responses considered as facilitators (+) in alignment processes of this nature. In the same way, consistency was evidenced between scores considered low, with categorizations of responses characterized as inhibitors (-) in strategic alignment processes.

On the other hand, the response categories of the in-depth interview phase, revealed by the reporting units, gave broad support to what was previously reviewed in the literature, in reference to such processes. Table 6 represents the segmentation described above, combining scores gotten from the new construct, with spontaneous answers.

Table 6: Summary of Combined Analysis (scores and in-depth interviews)

Group according score	N° enterwiers	Consolidated average score	IT average score	BS average score	Categories in-depth interview IT (+)	Categories in-depth interview IT (-)	Categories in-depth interview BS (+)	Categories in-depth interview BS (-)
Group 1	16 (9TI-7BS)	3.91	4.00	3.79	TI1, TI2, TI3, TI4, TI5, TI6, TI7, TI8, TI10, TI11, TI13, TI14, TI8, TI22, TI23, TI24, TI25, TI26	TI12, TI17, TI21	BS1, BS4, BS5, BS7, BS8, BS10, BS11, BS12, BS13, BS14, BS15, BS17, BS18, BS19, BS23	BS6, BS9, BS20, BS21
Group 2	14 (6TI-8BS)	2.37	2.34	2.39	TI2, TI6, TI9, TI10, TI11, TI15, TI17, TI27	TI16, TI19, TI20, TI21	BS5, BS7, BS13, BS14, BS17, BS23	BS2, BS3, BS6, BS9, BS16, BS20, BS22

4.7 Findings from the Combined Analysis

First of all, it is important to point out that the analysis provided by Table 3 turned out to be very useful to understand how the scores provided by the updated model are related to the answers obtained from the same interviewees, after completing this instrument. In this summary it is possible to observe consistency between scores considered high on the average of the total of interviewees, with respect to the answer categories of the in-depth interviews, and in the same way, a consistency in the inverse sense, that is to say, for a score considered low, with response categories grouped for these scores, which support its value.

Summarizing the findings of both phases, we can conclude that: as well as a good perception of the practices of the organization, measures in the dimensions of the new model, result in higher levels of alignment (higher scores). Practices such as those indicated in the resulting categories from in-depth interviews have a positive and therefore desirable impact on any organization that aspires to align the business with the IT function. As a conclusion of this task, examining the information provided by the two groups of interviewees in both data collection instruments, it was possible to observe a solid consistency in this contrast.

Another point that deserves to be highlighted, relates to certain aspects that would make an important difference between companies with high scores versus low scores, - according to the scale of the model - and that in turn have a consistent correlation with the arguments delivered by the in-depth interview phase. According to this, the existence of two variables that are present with greater force in those companies with higher scores is evident, namely: 1) Dependence on IT in the organizational structure, and, 2) Explicit definition - from the managerial level of the company - in order to initiate a business-IT alignment process, or digital transformation process (in the case of some companies in the sample that had started with this initiative).

These findings allow us to note that there would be a greater degree of alignment to the extent that the executives of the organizations have a shared vision about certain organizational practices, described in the literature as facilitators for this type of alignment and that are present in the answers that emerge from the spontaneous responses of the interviewees.

5. Limitations, Advantages and Future Improvements

5.1 Limitations

The nature of the investigation, with a non-probabilistic conformation of the sample, impedes the generalizability of the results of the study exploring the modifications to SAMM; therefore, this study is neither predictive nor confirmatory. Accordingly, it is not possible to make inferences about the results of the study, despite the application of an empirical, rational and analytical method.

Also, as part of the research, it was found that some companies - particularly the larger ones - were implementing parallel IT structures, a concept known from recent literature as bimodal-IT (Haffke et al., 2017; Horlach, et al., 2016), with the objective of making major changes in the organization, redefining and optimizing processes, along with carrying out the experimentation necessary to support innovative uses of IT in a digital business context, thus not affecting the operation of the company supported by its current IT area. The different behavior that could exist in these parallel

structures of IT and its relation with the operational areas, were not considered in this work.

5.2 Advantages

The decision of using two data collection tools, is considered a valuable contribution to the research and its conclusions, giving greater strength to the findings obtained throughout the process. The results obtained by both tools allowed, on the one hand, to test the new construct, applying in this process the rigor of an academic research, verifying its internal consistency and validity. On the other hand, the in-depth interview phase allowed complementing the analysis of the pilot test results, having found favorable results in both contrasts.

5.3 Future Improvements

It is recommended to test the updated model with a larger sample, by means of a sample design that allows confirmatory conclusions, as well as to reinforce this application with qualitative techniques that can suggest revisions to the alignment maturity measurement models, or elements to modify the dimensions already incorporated in the updated model.

6. Conclusions

After concluding this work, having used an updated model that better captures the changes in this digital environment - operationalized at the same time by means of a new instrument, with favorable results in the corresponding tests – and combining numerical result with unstructured information, the results to which it has arrived are undoubtedly interesting to analyze.

On one hand, when analyzing the scores obtained from the application of the questionnaire, we perceive a better perception about the practices of the organization from IT executives in comparison with executives from the operational areas. At the same time, a fact that is relevant to mention is the low score exhibited by both, IT executives and non IT executives, as an average of all dimensions, and also for each one of them. Among all the evaluated dimensions, two of them stand out for their notoriously low score (innovation and rewards). On the other hand, when grouping the scores obtained by executives of the whole sample - using the score level as a segmentation criterion, generating two groups - the first one, whose score average is above the average of the whole sample, and the second one, whose score average is below the average of the whole sample - a new picture emerges, noticeably different.

When the scores are presented with this arrangement, combining them with the information provided by the spontaneous answers from in-depth interviews, we can see a correlation and congruence between scores and certain category answers. In this way, higher scores are more prevalent in categories characterized as facilitators in alignment processes, while the opposite occurs with low scores, findings that are in line with the literature review for these type of processes.

Although among companies with high scores, represented by group 1, or lower scores represented by group 2, a better perception of IT executives persists on the practices of the organization at a consolidated level. At a disaggregated level, however, the perceptions of IT and non IT executives about the practices of the organization vary according to the dimension in question.

As a conclusion of this work, it is possible to emphasize four major points, first: Such results demonstrate how certain practices considered to be facilitators in processes of strategic alignment between the business and IT, effectively fulfill this role in organizations. In this regards, the lack of the latter will limit the mutual understanding between business and IT function. Second: The business-IT alignment maturity level obtained in this study, for companies operating in Chile, could reflect the level of alignment in companies with similar characteristics to the sample, with an important number of them showing a worrying misalignment between the business strategy and the IT function, limiting their chances of success in this digital environment. Third: By explicitly observing the 4 dimensions that update the reference model, it is possible to point out that they are an important contribution to these kinds of tools, so it is suggested that they should be incorporated into models, whose purpose is to measure the level of strategic alignment between business and the IT function, in this digital scenario. Four: when confronting the results of the investigation with the three key digital pillars mentioned in section 2.4, it is possible to observe that the pillar *building an innovative organization culture* appears as the weakest among the three. This means that – in an exploratory context – the lack of an innovation factor, associated with an appropriate reward systems, is impeding Chilean companies from achieving alignment with enterprise objectives and co-creating innovative strategies and new business capabilities, on a larger scale than the remaining two digital pillars.

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