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IT Governance Mechanisms: A Literature Review

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Abstract. Nowadays information technology (IT) is present in all organizations. This pervasive use of technology has created a critical dependency on IT that calls for a specific focus on IT Governance (ITG). Organizations with effective governance have actively adopted a set of ITG mechanisms. However, ITG mechanisms are not well defined among the literature and in some cases there are incongruities in their definition. In this paper we intend to perform a literature review (LR) in order to elicit which are the main ITG mechanisms as well as to describe them and state what they are useful for. We finish our work with conclusion, contributions, limitations and future work.

Keywords: IT Governance, IT Governance Mechanisms, Literature Review

1 Introduction

Since IT (IT) has become crucial to the support, sustainability and growth of the business [35][36], this pervasive use of technology has created a critical dependency on IT that calls for a specific focus on IT Governance (ITG) [1][28].

ITG has been a concern in the last 20 years [50]**.** However, good ITG is no longer a "nice to have", but a "must have" [29] and can contribute to higher returns on assets at a time when businesses are increasing their technology investment [5]. Indeed, Gartner states that ITG has been recognized as a CIO top-10 issue for more than five years and has risen in priority between 2007 and 2009 [34].

Enterprises with effective ITG have actively implemented a set of ITG mechanisms that encourage behaviors consistent with the organization's mission, strategy, values, norms, and culture [7]. ITG can be deployed using a mixture of various structures, processes and relational mechanisms [16]. When designing ITG, it is important to recognize that it is contingent upon a variety of sometimes conflicting internal and external factors. Determining the right mechanisms is therefore a complex endeavor [1].

Among the literature several authors argued that organizations should use ITG mechanisms [1][3][12], but few researches attempt to describe and provide a complete explanation on ITG mechanisms. Plus, there is not a consensus about all the existent ITG mechanisms. The majority of the authors point a set of ITG mechanisms without justifying why those and not others, were selected. What's more, in some cases they overlap each other.

In this work we propose to perform an extensive Literature Review (LR) in order to elicit all the relevant ITG mechanisms describing them and pointing out the main references. This work aims to solve the incongruities and inconsistencies about ITG mechanisms, to thereby increase the consensus about this subject. To do this, it is necessary show the incongruities and inconsistencies and how to solve this problem.

In the next section we introduce the research methodology where we elicit the main steps to perform a LR. Afterwards we describe the problem this research intends to help solve. We follow with a LR regarding ITG mechanisms and identify and describe the main ITG mechanisms. Then, we describe how we evaluate our work. We finish with conclusion about the research as well as contributions, limitations, and future work.

2 Research Methodology

A review of prior, relevant literature is an essential feature of any academic project. An effective review creates a firm foundation for advancing knowledge. It makes theory development easier, closes areas where there is a plethora of research, and uncovers areas where research is needed [32]. A LR is *"the use of ideas in the literature to justify the particular approach to the topic, the selection of methods, and demonstration that this research contributes something new."* [37].

Constructing a review is a challenging process because we often need to draw on theories from a variety of fields. Conducting an effective LR that will yield a solid theoretical foundation should also provide a firm foundation to the selection of the methodology for the study [39]. Nevertheless, the LR represents the foundation for research in IS. As such, to review articles is critical to strengthen IS as a field of study [32].

To have a quality IS research we should conduct a LR that will enable researchers to find out what is already known. When proposing a new study or a new theory, researchers should ensure the validity of the study and reliability of the results by making use of quality literature to serve as the foundation of their research.

In a review of literature researchers should use sources that substantiate the presence of the problem under investigation [38].We analyzed the current literature about LR and identified the most important steps and tips to be followed in order to provide an effective LR. These steps can be seen in Table 1.

3 Problem

The dependency on IT becomes even more imperative in our knowledge-based economy, where organizations are using technology in managing, developing and communicating intangible assets such as information and knowledge [40].

Corporate success can, of course, only be attained when information and knowledge, very often provided and sustained by technology, is secure, accurate, reliable, and provided to the right person, at the right time, and at the right place [41][45].

Table 1. Literature Review Main Steps

Nº	STEP	Description	This Paper
1	**Identifying relevant literature**	A high-quality review is complete and focuses on concepts. A complete review covers relevant literature on the topic and is not confined to one research methodology, one set of journals, or geography. The quality of the literature used plays a significant role in advancing the knowledge of the researcher and the overall Body of Knowledge (BoK) [31][32].	**All document**
1.1	**Validating the quality of the IS literature**	In order to select the source material for the review, the following steps must be performed [31][32][33]: a) The major contributions are likely to be in leading journals. You should also examine selected conference proceedings, especially those with a reputation for quality. b) Go backward by reviewing the quotations for the articles identified in step 1 to determine prior articles you should consider. c) Go forward to identify articles citing the key articles identified in the previous steps.	**Several journal articles, the main digital libraries (IEEE, ACM,etc)**
1.2	**Testing for applicability to your study**	While searching for quality literature is essential, it is also important to identify articles that are applicable to the proposed study. This issue has two critical facets. The first deals with the inclusion or exclusion of articles from the LR, and the second deals with ethical and unethical use of references [31][33].	**Only papers with focus on ITG and ITG mechanisms were considered**
2	**Structuring the review**	Concept-Centric against Author-Centric. Thus, concepts determine the organizing framework of a review [32].	**Table 2, Table 3, Table 4**
2.1	**Writing arguments and argumentation theory**	Describe the problem and support it with good references [31].	**Section 1, Section3**
2.2	**Apply the literature**	Application is demonstrated by activities such as demonstrating, illustrating, solving, relating, and classifying. In the context of the LR, application is most directly revealed by the two-step process of [31]: a) Identifying the major concepts germane to the study; b) Placing the citation in the correct category.	**Spread over the article**
2.3	**Theoretical development in your article**	Add knowledge and advice for possible future work [32].	**Section 6.2**
2.4	**Creating discussion and conclusions**	Discussion and conclusions [32].	**Section 6.1**
3	**Tips for LR**	Tips for doing a good LR [31].	**All Document**
3.1	**Know the literature**	Describes what the work is about [31].	**All Document**
3.2	**Comprehend the literature**	Demonstrates that you understand the work and if possible provides some examples [31].	**All Document**
3.3	**Analyze the literature**	Demonstrates the work relevance [31].	**All Document**
3.4	**Synthesize the literature**	Several references for one phrase instead of a reference for each phrase [31].	**When Possible**
3.5	**Evaluate the literature**	Demonstrate if the work is already validated or not [31].	**All Document**
3.6	**Tone**	A successful LR constructively informs the reader about what has been learned. In contrast to specific and critical reviews of individual papers, it tells the reader what patterns you are seeing in the literature. Do not fall into the trap of being overly critical [32].	**All Document**
3.7	**Tense**	Present or past tense? We think that we should use the present, because it gives to the reader a great sense of immediacy. There is an exception: an author's opinion can change with time, so we should use the past tense when quoting someone [32].	**All Document**
4	**Evaluating the theory**	With each revision, the paper ripens. Expose your paper to the fresh air and sunshine of collegial feedback. With each discussion, new ideas emerge. The ripening process is facilitated with hard work and frequent revisions [32][47].	**Section 5**

This major IT dependency also implies a huge vulnerability that is inherently present in certain complex IT environments [42][43][46]. The question of the 'productivity paradox' - why IT have not provided a measurable value to the business world - has puzzled many practitioners and researchers [41][42][43].

All the issues described above point out that the critical dependency on IT calls for a specific focus on ITG [1][28]. ITG is a concept that has suddenly emerged and become an important issue in the IT field [44]. Precisely when this new challenge began surfacing is unknown, but it is now a discussion issue within most organizations. Some corporations and government agencies began with the implementation of ITG to achieve a fusion between business and IT and to obtain needed IT involvement of senior management. In surveys, CIOs also indicate ITG as an important management priority [16].

To implement ITG, organizations use a mixture of various structures, processes and relational mechanisms. When designing ITG, it is important to recognize that it is contingent upon a variety of sometimes conflicting internal and external factors. Determining the right ITG mechanisms is therefore a complex endeavor and it should be recognized that what strategically works for one company does not necessarily work for another [30], even if they work in the same industry sector [1].

However, ITG mechanisms are not well defined among the literature and this paper intends to identify, describe and clarify the most relevant ITG mechanisms.

4 Literature Review

Throughout this research we tried to follow the main steps (Table 1) we have identified in order to provide an effective LR. We started looking into journals articles. Moreover, we also looked into some of the most known communities, as IEEE and ACM. After the identification of the most relevant articles in those communities' digital libraries, we then follow the articles referenced in each identified article. We also identified the main authors and looked for their future and prior work.

We read 58 articles about ITG mechanisms from which 27 articles were identified as relevant to this study.

The selection criteria for the ITG mechanism articles were based on:

- Articles must explicitly be about ITG
- Articles must explicitly mention ITG mechanisms
- Articles must contain a clear and not ambiguous definition of the mentioned ITG mechanisms

We have adopted a concept-centric approach instead an author-centric approach as advised in step 2 of the Table1. A concept-centric approach guarantees a good synthesis of the literature [32]. In Table 2, we can see an example of the application of the concept-centric approach.

In section 3 we emphasize the problem under which this paper is grounded as advised in step 2.1 of the Table 1.

Possible future work (step 2.3 of Table 1) is proposed in section 6 where we explain how future re-searchers can improve this work and add knowledge to ITG BoK.

In section 6, we will draw conclusions about this research and argue about the limitations that we found in the course of our research. We will also provide the contributions that this paper adds to the current ITG Bok (step 2.4 of Table 1).

Throughout this LR we worked hard to follow as much as we could the tips presented in step 3 of Table 1.

As recommended in step 4 of the Table 1, in section 5 we explain how we have evaluated our theory in order to have the best theory. In Table 2 we summarize the Structure mechanism found in the LR, in Table 3 we summarize the Processes mechanisms found in LR and in Table 4 we summarize the Relational mechanisms found in LR. We also provide the respective references of each mechanism.

Table 1. ITG Structure Mechanisms

Structure	
Integration of governance /alignment tasks in roles & responsibilities	[1][2] [3][10][16][18]
IT strategy committee	[1][2][3][8][10][12][15][16][18]
IT steering Committee	[1][2][8][9][10][11][12][13][15][16][18]
CIO on Board	[1][10][12][18][19]
IT councils	[25][27]
IT leadership councils	[7][22][25]
E-business advisory board	[1][10][19]
E-business task force	[1][10][19]
IT project steering committee	[1][3][10][13]
IT organization structure	[1][10][12][16][18]
• **Centralized**	[1][2][4][9][11][12][15][19][21][22]
• **Federal**	[1][2][4][7][9][11][12][15][19][21]
• **Decentralized**	[1][2][4][9][11][12][15][19][21][22]
IT expertise at level of board of directors	[3][12]
IT audit committee at level of board of directors	[3][12][14]
CIO on executive committee/CIO reporting to CEO and/or COO	[3][4][12][13][17][28]
ITG function/officer	[3][4]
Architecture steering committee	[3][4][8][12][15][25][28]
IT investment committee or capital improvement	[4][12][15][22]
Business/IT relationship managers	[12][15][17][19][25]

In Table2, Table 3 and Table 4 we have tried to standardize the ITG mechanisms since we believe this standardization may help to fulfill this paper problem. For example, the IT BSC that in the article [4] appears as a Relational Mechanism that is placed here as a Process Mechanism, once that choice is the most used among the literature [2][3][10][19].

Likewise we have grouped some ITG mechanisms, taking into account the definitions proposed by the authors. One example is: Working with non-conformist, provided by [12] that was joined with ITG campaigns provided by [3]. The same occur with the merge of Web-Based Portals [12] and IT portal [4]. The reasons that led to this merge were based on the similarity of both definitions.

Table 3. ITG Processes Mechanisms

Processes	
IT BSC	[1][2][6][10][16][18][19]
Strategic Information System Planning	[1][2][3][16]
• **Business System Planning**	[1][2][3][16]
• **Critical Success Factors**	[1][6][16][19]
• **Competitive forces model of Porter**	[1][16]
• **Business Process Reengineering approach**	[1][16]
• **Value chain models of Porter**	[1][16]
Frameworks ITG	[1][2][10][16][18]
• **COBIT**	[1][2][3][10][14][16][18]
• **COSO/ERM**	[3][28]
• **ITIL**	[1][2][10][14][16][18]
Service Level Agreement	[1][2][3][4][5][10][11][12][15][18][19]
Business/IT alignment model	[1][10][14]
• **Strategic Alignment Model (SAM)**	[1][2][10][19]
ITG Maturity Models	[1][10][16]
Portfolio management	[3][4][26]
• **Information Economics**	[1][2][3][4][6][10][16][18][19][26]
• **Business Cases**	[3][13][19]
• **ROI**	[1][3][12][16][18]
• **VALIT**	[2][3][14]
Chargeback	[3][4][7][12][15][25]
ITG assurance and self-assessment	[3][15]
Project governance/management methodologies	[3][10][13]
IT budget control and reporting	[3][7][11][13]
Demand management	[4][26]
Architectural exception process	[12][27]

Table 4. ITG Relational Mechanisms

Relational	
Active participation by principle stakeholders	[1][10][19]
Collaboration between principle stakeholders	[1][10][19]
Partnership rewards and incentives	[1][2][10][18][19][20]
Business/IT collocation	[1][2][3][10][19]
Shared understanding of business/IT objectives	[1][2][10][11][18][19]
Cross-functional business/IT training	[1][2][3][10][18][19]
Cross-functional business/IT job rotation	[1][2][3][10][16][18][19]
ITG awareness campaigns	[3][12]
Corporate internal communication addressing on a regular basis	[3][11]
IT leadership	[3][13][15][28]
Informal meeting between business and IT executive/senior management	[3][23][25]
Executive/Senior management give the good example	[3][23][28]
Business/IT account management	[3][28]
Knowledge management (on ITG)	[3][12]
• **Web-based (IT) portals**	[3][4][12][15][18]
Senior management announcements	[12][22]
Office of CIO or ITG	[12][17][27]

Moreover, we have eliminated all the ITG mechanisms with only one reference, to maintain the consistence of this research and ensuring in this way that the ITG mechanisms that appear in this table are the mechanisms that actually drive to a better agreement of the experts and scientific community.

4.1 Types of Mechanisms

As previously stated in this paper, enterprises must design and implement three types of ITG mechanisms [16] in order to promote desirable IT behaviors.

All these types of ITG mechanisms are important and they must be combined in order to create a holistic approach that promotes effective and efficient ITG throughout the organization.

The description of the three types of ITG mechanisms are detailed below:

- **Structure Mechanisms:** The most visible ITG mechanisms are the organizational units and roles responsible for making IT decisions, such as committees, executive teams, and business/IT relationship managers [2][12][24][27].
- **Processes Mechanisms:** Formal processes for ensuring that daily behaviors are consistent with IT policies and provide input back to decisions. These include IT investment proposal, architecture exception processes, Strategic Information System Planning, chargebacks, among others [2][12][24].
- **Relational Mechanisms** – The relational mechanisms complete the ITG framework and are paramount for attaining and sustaining business-IT alignment, even when the appropriate structures and processes are in place. For attaining and sustaining business-IT alignment, mechanisms like announcements, advocates, channels and education efforts are used [6][24][27][28].

Not all researchers give the same name to the different types of ITG mechanisms however the meaning is equivalent. For example, Weill and Ross [12] call communication mechanisms while Grembergen and De Haes [2] use the term relational mechanisms to the same type of ITG mechanisms. In this paper we have chosen to call these mechanisms relational mechanisms. This decision is due to the fact that relational mechanism is the term most used among ITG literature [10][13][19].

4.2 Structure Mechanisms

In this section we will describe the structure mechanisms. Unfortunately, due to space limitations we only provide the description of some mechanisms.

IT Steering Committee: The IT steering committee is situated at executive level. It is responsible for determining business priorities in IT investment [3]. It assists the Executive in the delivery of the IT strategy, overseeing the day-to-day management of IT service delivery and IT projects. IT steering committee focuses particularly on implementation [1], tracking IT investments, setting priorities and allocating scarce resources [8]. Firms using steering committees have been found to exhibit greater

business executive attention to IT-related activities, a greater commitment to IT planning practices and a forward-looking IT project portfolio [9].

IT Strategy Committee: The IT Strategy Committee operates at the board level. The IT Strategy Committee – composed of board and non-board members – should assist the board in governing and overseeing the enterprise's IT-related matters. This committee should ensure that IT is a regular item on the board's agenda and should work in close relationship with the other board committees and with management in order to provide input, and to review and amend the aligned enterprise and IT strategies [1][3][16].

CIO on Board: ITG effectiveness is only partially dependent on the CIO and should be viewed as shared responsibility and enterprise wide commitment towards sustaining and maximizing IT business value. The presence of the CIO on Board will ensure that IT will be a regular item on the board's agenda and that it will be addressed in a structured manner. That presence will also enhance the ability of the board to understand the role of IT in business strategy and to map the ITG role of the executive team. The CIO should report on a regular basis to the board [12][16][19].

CIO on executive committee/ CIO reporting to CEO and/or COO (Chief Operation Officer): CIO has a direct reporting line to the CEO and/or COO. This ensures that IT is part of the executive team where most strategy discussions begin and end. With that interaction IT can be an enabler of the organization [3][4].

Architecture Steering Committee: Committee composed of business and IT people providing architecture guidelines and advises on their applications. The main goal of this committee is identify strategic technologies [3][12][15][25].

Business/ IT relationship managers: Business/IT relationship managers Business/IT relationship managers act as the intermediary between the business and IS, playing a critical daily two-way role by helping IS understand how business operates and giving the business units an entry point to IS. They play an important role in communicating mandates and their implications and supporting the needs of business units managers while help them see benefits rather than inconveniences [12][15].

IT expertise at level of board of directors: Members of the board of directors have expertise and experience regarding the value and risk of IT. A lack of board oversight for IT activities is dangerous; it will put the firm at risk in the same way that failing to audit its books would [3][51].

4.3 Process Mechanisms:

In this section we will describe the process mechanisms. Unfortunately, due to space limitations we only provide the description of some mechanisms.

IT Balanced Scorecard (IT BSC): An important part in the implementation process of strategic alignment is the performance measurement of IT and of IT related to the business. BSC has been applied in the IT function and its processes. Recognizing that IT is an internal service provider, the proposed perspectives of BSC should be changed accordingly, with corporate contribution, user orientation, operational excel-

lence, and future orientation. Linking the business BSC and the IT BSC is a supportive mechanism for ITG [1][2][16].

Chargeback: Chargeback is an accounting mechanism for allocating central IT costs to business units. The purpose of chargeback is to allocate costs so that business units IT costs reflect the use of shared services while the shared services unit matches its costs with the business it supports. When IT understands its costs and charges out accordingly, chargeback processes demonstrate the cost saving resulting from shared services. Enterprises with effective costing mechanism find that chargeback can foster useful discussions between IT and business units about IT charges, leading to better-informed ITG decisions [3][12][15].

Service Level Agreements: A Service Level Agreements (SLA) is defined as "a written contract between a service provider of a service and the customer of the service". The functions of SLAs are: Define what levels of service are acceptable by users and are attainable by the service provider; define the mutually acceptable and agreed upon set of indicators of the quality of service. Three basic types of SLAs can be defined: in-house, external and internal SLAs. The differences between those types refer to the parties involved in the definition of the SLA.

The negotiation of SLAs should be completed by an experienced and multi-disciplinary team that equally represents the user group and the service provider.

The major governance challenges are that the service levels are to be expressed in business terms and that the right SLM/SLA process has to be put in place [1][2][16].

Architectural Exception Process: Technology standards are critical to IT and business efficiency. But occasionally exceptions are not only appropriate, they are necessary. Enterprises use the exception process to meet unique business needs and to gauge when existing standards are becoming obsolete.

Without a viable exception process, business units ignore the enterprise wide standards and implement exceptions with no approval.

The effectiveness of the architecture exception process depends on the ability of the IT unit to research and define standards and on the enterprise's commitment to technology standards [12][27].

Demand management: Demands for IT resources come from all directions and in all forms. Some demand is routine, other demand is strategic and complex.

Demand management forces all IT demand through a single point, where the demands can be consolidated, prioritized and fulfilled [4][26].

4.4 Relational Mechanisms

In this section we will describe the relational mechanisms. Unfortunately, due to space limitations we only provide the description of some mechanisms.

ITG awareness campaigns: Campaign to explain to business and IT people the need for ITG. Working with managers who stray from desirable behaviors is a necessary part of generating the potential value of governance processes. Therefore, it is neces-

sary to communicate with those managers in order to educate them for IT issues [3][12].

IT leadership: The ability of the CIO or similar role to articulate a vision for IT's role in the company and ensure that this vision is clearly understood by managers throughout the organization. Hence, we can say that the goal of IT leadership is to have coordination across the enterprise [3][15][23].

Informal meetings between business and IT executive/senior management: Informal meetings, with no agenda, where business and IT senior management talk about general activities, directions, etc. (e.g. during informal lunches) [3][25].

Corporate internal communication addressing on a regular basis: Internal corporate communication regularly addresses general IT issues [3][23].

Executive/Senior management giving the good example: Senior business and IT management acting as "partners" [3][23].

Summarizing, we can argue that our theory consist in an analysis of the literature in order to elicit the most common ITG mechanisms. In our theory we have tried to eliminate some gaps that, as were aforementioned, may difficult the implementation of ITG.

We also have defined some of the ITG mechanisms presented in Table 2. These definitions are important since it is important to have a deep knowledge about the meaning of the ITG mechanisms before choosing the most suitable to the organizations.

5 Evaluation

An evaluation of a theory in a LR is a difficult and nebulous task [32]. In this section we describe how we evaluated our research so far in order to validate our theory. Our theory, as it was aforementioned state that there are some gaps about ITG mechanisms that need to be solved. Our theory provides a contribution to solve these problems. As we can see in Section 4, some similar definitions were merged into the same mechanism. This standardization will be useful to all the ITG practitioners and to the scientific community.

As Weick [47] argued, a theory must be explanatory. The resulting theory of this research consists in the identification of the most relevant ITG mechanisms. In this theory, we gathered information from several articles and books, and then, we not only summarized the most important ITG mechanisms but also described them.

We argue that our theory is explanatory once it explains the most important ITG mechanisms and also provides their definition. Unfortunately, due to space limitations, we couldn't provide the definition of all the identified ITG mechanisms. Some authors as Davis and Lewis [48][49] argued that a theory must be interesting and relevant. In our viewpoint, this theory is relevant and interesting since, as stated in section 3, ITG is one of the CIO top issues and ITG mechanisms have been pointed as the best way to implement ITG in organizations. However, the ITG literature lacks a formal and consensual definition of ITG mechanisms. Therefore, we argue that this

theory help ITG community to understand the ITG mechanisms as well as their purpose.

An important step in evaluation of LR researches is peer-review. Therefore we submitted our work to other researchers (as advised in step 4 of Table 1) so they can advise us of possible improvements. After that, we review our research taking into consideration their comments. The most relevant advice was that we should remove all the ITG mechanisms with less than two references in order to consolidate our theory.

6 Discussion and Conclusions

In our opinion, one of the main contributions of this paper is the clarification of some relevant ITG concerns. Several researchers use and propose ITG mechanisms but do not describe them or tell what they are about. We argue that such fact is a lack of knowledge in ITG literature that must be solved. It is urgent to understand what kind of ITG mechanisms exist and what their purpose is. Thus, in this paper we try to clearly explain the most important ITG mechanisms.

Some important authors in ITG literature (for example Weill, De Haes, Grembergen, etc.) use ITG mechanisms in their research. However, even these researchers have some incongruities among them since they use different names to the same ITG mechanism. In this paper we tried to solve this problem by formalizing the ITG mechanisms and mitigating ambiguities.

To sum up, this paper presents and describes all the most important ITG mechanisms. Plus, we have eliminated some incongruities about ITG mechanisms' names and definitions.

6.1 Contributions and limitations

Quality research must provide justifications for the potential contributions provided by the proposed study. Such justifications should demonstrate how the proposed research contributes something new to the overall BoK or advances the research field's knowledge [32].

In this section we describe the contributions of this paper to ITG field BoK. We believe that having a set of formalized ITG mechanisms will help researchers and practitioners to understand and select which are the most appropriate ITG mechanisms and their importance to achieve effective and efficient ITG.

Furthermore, we believe that the presented set of ITG mechanisms as well as their description will increase the knowledge about the meaning and importance of the mechanisms, facilitating their correct adoption by organizations.

Finally, we believe that this research mitigates ambiguities among the ITG mechanisms and their respective meanings.

Of course our research has some limitations as well. So far we took into consideration 58 articles, which can be viewed as a small set of ITG articles for a LR paper.

However, ITG is a recent discipline [24][28] and we argue that 58 articles are a considerable amount of researches to analyze.

Plus, as previously stated, from 58 we excluded 31 articles because they did not follow our criteria. It is more than 50% of the initial articles. This is evidence that many researchers use and propose ITG mechanisms but few attempt to describe them and explain what they are useful for.

Therefore, we argue that the main contribution of this research is the identification and description of the main ITG mechanisms.

6.2 Future work

According to step 2.3 (Table 1), in this section we must provide some work that can and must be done in the future in order to go further in the ITG field.

We believe that in the future some researchers must analyze ITG case studies in order to understand how organizations are adopting ITG mechanisms. Then, researchers should study which ITG mechanisms are more appropriated to each kind of organization always taking into consideration the context of each organization. Possibly the ITG contingency factors already proposed in ITG literature [29] could be well applied for this purpose.

As previously stated, we should have a holistic approach in ITG. So, we argue that another future work should be concerned with the identification of which mechanisms can or must work together and which ones are not combinable at all.

Last but not least, the identification of new ITG mechanisms must be a continuous work and we argue that future researchers should complement and improve the presented ITG mechanisms (Table 2) with new and innovative ITG mechanisms.

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