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Abstract:

In many organisations, information technology (IT) has become crucial in the support, sustainability, and growth of the business. This pervasive use of technology has created a critical dependency on IT that calls for a specific focus on IT governance. IT governance consists of the leadership and organisational structures and processes that enable the required alignment between business and IT. This practice-oriented research concentrates on the IT governance practices that organisations can leverage to implement IT governance in reality. Based on literature research, pilot case research and Delphi research, this paper provides insights regarding the effectiveness and ease of implementation of IT governance practices and provides a minimum baseline of practices that organisations at least should have. Via this research, we want to contribute to new theory building and assist practitioners by providing more guidance on how IT governance can be effectively implemented.

Keywords: IT governance, business/IT alignment, Delphi research

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I. INTRODUCTION

In many organisations, information technology (IT) has become crucial in the support, sustainability and growth of the business. This pervasive use of technology has created a critical dependency on IT that calls for a specific focus on IT governance. IT governance consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategy and objectives [ITGI 2003; Van Grembergen 2007]. Today, IT governance is high on the agenda of many organisations. [Van Grembergen 2007]

This research focuses on which practices (structures, processes, and relational mechanisms) an organisation can leverage to ensure that IT governance becomes a reality in the organisation. This practice-oriented research focus is relatively unexplored in academic literature. Many research projects focused on the impact of specific contingencies on e.g. centralised versus decentralised governance structures [e.g. Ahituv et al. 1989; Brown and Magill 1994; Olson and Chervany, 1980] and on how strategic alignment impacts business performance [e.g. Croteau and Bergeron 2001; Sabherwal and Chan 2001; Teo and King 1996]. Less research can be found on how organisations can effectively implement IT governance in day-to-day practice. Via this research, we want to contribute to new theory building in the IT governance domain of knowledge and assist practitioners by providing more guidance on how IT governance can be implemented.

This research paper aims to be strongly practice-oriented while maintaining academically rigorously executed. This approach complies with the arguments made by of Benbasat and Zmud [1999] targeted at "IS academics who are committed to both applying rigorously the methodology best suited to their research goals and better accommodating practical relevance with their research endeavours." Similar arguments are made in the work of O'Keefe and Paul [2000] who promote consumable IS research that is both academically rigorous and relevant to practice.

II. RESEARCH QUESTIONS AND SCOPE

As proposed by work from among others Peterson [2004], Weill and Ross [2004], Peterson et al. [2002] and Van Grembergen [2003], IT governance can be deployed using a mixture of various structures, processes, and relational mechanisms. IT governance structures include "structural (formal) devices and mechanisms for connecting and enabling horizontal, or liaison, contacts between business, and IT management (decision-making) functions" [Peterson 2004] (e.g. steering committees). IT governance processes refer to "formalisation and institutionalisation of strategic IT decision making or IT monitoring procedures" [Peterson 2004] (e.g. IT balanced scorecard). The relational mechanisms finally are about "the active participation of, and collaborative relationship among, corporate executives, IT management, and business management [Peterson 2004]" (e.g. training). Relational mechanisms are crucial in the IT governance framework and paramount for attaining and sustaining business-IT alignment, even when the appropriate structures and processes are in place [Keill et al. 2002; Weill and Broadbent 1998; Henderson and Venkatraman 1993]. Some examples of these structures, processes, and relational mechanisms are provided in Figure 1.

Goal of this research is to provide more insight into which practices are—or can be—used by contemporary organisations and how practitioners can leverage these practices. To address this goal, this research is build around some key questions:

1. What IT governance best practices are—or can be—applied in practice?
2. What is the perceived effectiveness of these IT governance practices?
3. What is the perceived ease of implementation of these IT governance practices?
4. What is a minimum set or minimum baseline of required IT governance practices?

However, it is recognised that, in order to maintain a sufficient level of internal validity, the research scope needs to be narrowed down. Our focus on internal validity builds on the work of Cook and Campbell [1979] who state that there is always a balancing act between different types of validity. They argue that "for investigators with theoretical interests our estimate is that the types of validity, in order of importance, are probably internal, construct, statistical conclusion, and external validity… The priority ordering for many applied researchers is something like internal validity, external validity, construct validity of the effect, statistical conclusion validity, and construct validity of the

cause." As this research can be categorised as applied research, the focus is indeed on internal validity in the first place.
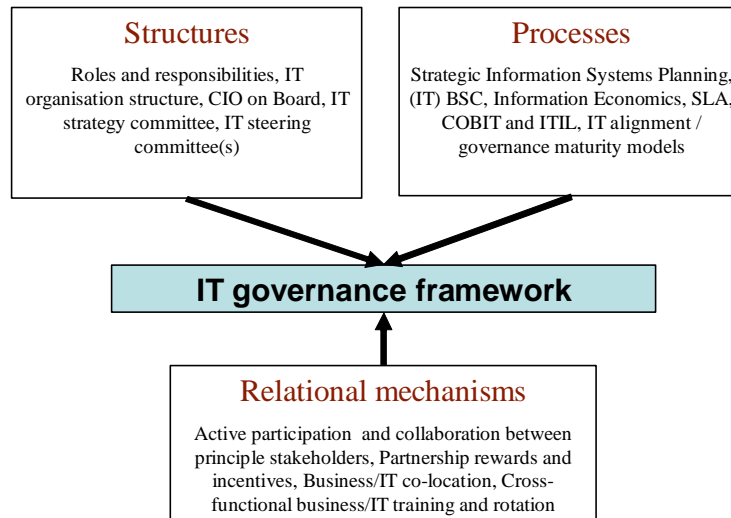

Figure 1. Example Practices for IT Governance

To ensure sufficient internal validity, the research was therefore scoped down on multiple aspects. In the first place, it is acknowledged that the use of IT governance best practices might be different in different types of industries. Organisations in the finance industry are highly dependent upon IT which probably requires the finance industry to have a more solid and broad IT governance framework. Therefore, the focus of this research is only on one sector, more specifically the financial services sector, to control the contingencies resulting from differences in industries. The choice for the financial services sector is made because, among different industries, financial services, together with manufacturing and retailing, is the first industry to use information technologies and as such is already more matured in these domains, making empirical research interesting [Chiasson and Davidson 2005].

The scope was also reduced in geographic terms and regarding size of organisations. To avoid cultural differences between regions worldwide and contingencies related to the size of the organisations, it was decided to only focus on typical Belgian financial services organisations with headcounts ranging from 100 to more than 1000 employees.

The final scope reduction focuses on the organisational level of IT governance practices. As indicated by Van Grembergen [2003], IT governance is situated at multiple layers in the organisation (see Figure 2): at strategic level where the board is involved, at management level within the C-suite layer and finally at the operational level with IT and business management. This implies that all these levels, business as well as IT, need to be involved in the IT governance process and they have to understand their individual roles and responsibilities within the framework.
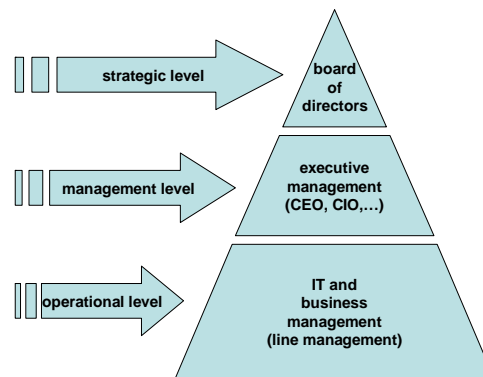
Figure 2. Three layers of IT Governance Responsibility

However, Peterson [2004] makes a clear distinction between IT governance and IT management. According to him, IT management is focused on the effective and efficient internal supply of IT services and products and the management of present IT operations. IT governance in turn is much broader, and concentrates on performing and

transforming IT to meet present and future demands of the business (internal focus) and business customers (external focus). This "higher-level" focus of IT governance is confirmed in the IT governance definition of ITGI [2005], which states that "IT governance is the responsibility of executives and the board of directors". Based on the considerations of Peterson [2004] and ITGI [2005], we will discard the operational oriented level (see Figure 2), which according to Peterson [2004] maps to IT management instead of IT governance.

III. RESEARCH METHODOLOGY

Because research in the domain of IT governance implementations is in its early stages and theoretical models are scarcely available, the nature of this research is exploratory rather than hypothesis testing. Indeed, the concept of IT governance, as it is understood now, only emerged late '90s [De Haes and Van Grembergen 2006; Weill and Ross 2004], and there has been little research material developed on which we can build. The latter is not only true because it is a new research domain, but as denoted by Benbasat and Zmud [1999], "Generally, IS researchers have been less successful than their colleagues in other business school disciplines in developing a cumulative research tradition. Without such cumulative results, it becomes difficult, if not impossible, to develop and assess strong theoretical models such that prescriptive actions can confidently be suggested for practice." By exploring this research domain in detail, we do however want to contribute to creating a basis for future research, by building theoretical models and generating potential hypotheses to be tested.

Exploratory research often builds on secondary research, "such as reviewing available literature and/or data, or qualitative approaches such as informal discussions with consumers, employees, management or competitors, and more formal approaches through in-depth interviews, focus groups, projective methods, case studies or pilot studies." [Ryerson 2007] Our research strategy therefore also triangulates between multiple different research methods: literature research, pilot case research and Delphi method research. This triangulation enables us to obtain a richer insight in reality, as also advocated by Mingers [2001]: "… different research methods focus on different aspects of reality and therefore a richer understanding of a research topic will be gained by combining several methods together in a single piece of research or research program."

Literature and Pilot Case Research

The research process started with exploring the research domain through a detailed literature research in the domain of business/IT alignment and IT governance. Papers and research reports of both academic and professional journals were collected, read, organised, analysed, and summarised into one master file, providing the researcher a complete and workable overview of existing literature relevant to the research domain. The focus was on finding an initial list of structures, processes and relational mechanisms that organisations can leverage to implement IT governance. At this moment, the research was not yet scoped down to only the Belgian financial services sector, in order to be able to capture an as broad spectrum as possible of IT governance practices. To complement the initial list of IT governance practices, pilot cases were described. These cases consisted of one in-depth case and five mini-cases. These case studies were based on multiple interviews with two to six business and IT managers in each organisation.

Two criteria are used to select the sample of pilot case studies: local proximity to enable the researcher to execute multiple in-depth interviews at site and diversity to enable the gathering of as rich data as possible on used structures, processes and relational mechanisms in practice. Therefore, Belgian based organisations were selected, both operating nationally and internationally in different sectors (finance, insurance, chemicals, steel).

Delphi Research

After the first exploration, the Delphi research methodology was used. The Delphi method can be characterized "as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem." [Linstone and Turoff 1975]. The Delphi method provides a structured process to solicit expert opinion on a particular subject and enables group interaction without needing a face-to-face meeting [Taylor-Powell 2002]. This method is particularly suited as a research methodology for this type of research as "the Delphi method technique lends itself especially well to exploratory theory building on complex, interdisciplinary issues, often involving a number of new or future trends" [Akkermans et al. 2003; Okoli and Pawlowski 2004]. Both Linstone and Turoff [1975] and Taylor-Powell [2002] stress the importance of selecting the expert panel. "Careful selection of participants is important since the quality and accuracy of responses to a delphi are only as good as the expert quality of the participants who are involved in the process. The number of participants depends upon the purpose of the Delphi and the diversity of the targeted population. Ten to 15 people may be adequate for a focused Delphi where participants do not vary a great deal." [Taylor-Powell 2002]. Based on these considerations, an expert panel was composed of 29 consultants, senior IT and senior business professionals who are all knowledgeable about organisations operating in the Belgian financial services sector. From this group, 22

experts continued to be involved in the full research effort (25 percent drop off rate), having different profiles (six senior business/audit management, eight senior IT management, eight senior business/IT consultants).

Using the Delphi method, these financial services sector experts needed to complete questionnaires in three rounds (see sample questionnaires in appendix). Similar to the Delphi research work of Keill et al. [2002], the Delphi research started with a preceded initial list of structures, processes and relational mechanisms. This list was operationalised based on literature research and the pilot case research as discussed previous section. In the first Delphi round, the respondents were only asked to provide their feedback on the initial list of practices, giving them the opportunity to make recommendations to add, change, or delete some of the practices. The focus of this first round was on validating the initial list of practices specifically for the financial services sector, so no other input or feedback was requested at this stage. In the second round, the respondents were asked to rate on a scale of 5, for each of the reviewed IT governance practices, the "perceived effectiveness" (0 = not effective, 5 = very effective) and the "perceived ease of implementation" (0 = not easy, 5 = very easy). The respondents were also asked to, taken the previous attributes (effectiveness - ease of implementation) and their personal experience into account, to provide the top 10 most important IT governance practices, which are in their opinion crucial elements or a minimum baseline of an optimal IT governance mix (the most important practice score 1, the second most important score 2, ... the 10th most important score 10). In the third and final round, the respondents were asked to reevaluate their own scores out of round 2, taking the group averages into account. The goal of this round was primarily to come to a greater consensus in the group. At the end of this round, the degree of consensus between the experts was measured leveraging Kendall's W coefficient [Schmidt 1997; Siegel 1988], specifically for the question on the minimum baseline. Schmidt [1997] offers an interpretation of Kendall's W, indicating that the reached level of consensus in this research of 0,53 can be considered moderate providing a fair degree of confidence in the results. This result, together with the fact that the top 10 list only slightly differed between round two and three, founded the decision not to start a fourth round.

An important challenge in this research approach is that different people often have different understandings of the same concept, also referred to as the "inadequate preoperational explication of constructs threat" [Cook and Campbell 1979]. Good examples are the use of IT steering committees and IT strategy committees. Although the latter is defined in literature as a committee at the level of the board of directors [ITGI 2003], many organisations are using the same terminology for a committee operating at executive or management level, which in fact should be catalogued as a steering committee. To address this, short and unambiguous definitions of all the processes, structures and relational mechanisms were provided (based on literature) and the questionnaire was pilot-tested for ambiguities and vagueness by eight people (practitioners and academics) before sent out to the Delphi experts.

IV. RESULTS AND INTERPRETATIONS

Literature and Pilot Case Research

From the pilot case studies and the literature research, different drivers for adopting IT governance were identified. An important one was certainly the need to comply with Sarbanes-Oxley requirements, which impacts heavily on the control environment in IT. Other important drivers for IT governance were the push to achieve economies of scales after mergers and acquisitions and budget pressure, resulting in a smaller budget for new projects. Challenge of course is then to optimally assign the remaining budget to projects and activities that are delivering value to the business. Finally, some pilot case companies mentioned that the IT governance project was more an effort of formalizing and structuring existing mechanisms already applied. Based on the findings of the literature research and the pilot case research, an initial list of IT governance practices was composed, as shown below (Table 1). For each of these practices, as short definition was developed based on the literature and pilot cases.

Delphi Research

The Delphi research was executed in three survey rounds. The first survey round focused on validating the predefined list of IT governance practices specifically for the financial services sector. Survey round 2 and 3 captured the perceptions of the respondents regarding effectiveness and ease of implementation of the IT governance practices and regarding a set of practices that could compose a minimum IT governance baseline. The results of these surveys rounds are discussed following.

Delphi Round 1—Validating the Initial List of IT Governance Practices

As mentioned in previous section, the delphi research started from a predefined initial list of practices which was derived from literature and pilot case research in many sectors. In the first survey round, the respondents were asked to validate this general list of practices to make it more oriented toward to financial services sector.

Table 1. Initial List of IT Governance Practices

	Name	Cross-references from literature	Cross-references from case research					
			KBC	AGF	VanBreda	Huntsman	Sidmar	CM
Structures	Integration of governance/alignment tasks in roles&responsibilities	Duffy, 2002; ITGI, 2003; Weill&Ross, 2004; De Haes&Van Grembergen, 2006	x		x	x		x
	IT steering committee(s)	ITGI, 2003; Luftman&Brier, 1999; Weill&Ross, 2004; De Haes&Van Grembergen, 2006	x	x	x	x	x	x
	IT strategy committee	ITGI, 2003; Nolan&McFarlan, 2005; De Haes&Van Grembergen, 2006	x					
	CIO on Executive Committee	ITGI, 2003, Weill&Ross, 2004; De Haes&Van Grembergen, 2006						
	CIO reporting to CEO	ITGI, 2003; Weill&Ross, 2004;	x	x		x		x
	Architecture Committee	ITGI, 2003; De Haes&Van Grembergen, 2006						
Processes	Strategic information systems planning	Earl, 1993; Rockart, 1979; Van Grembergen, 1997; Hammer&Champy, 1993; De Haes&Van Grembergen, 2006			x	x		x
	Balanced scorecard	Kaplan&Norton, 1992; Van Grembergen; 2000; Van Der Zee et al., 1999; De Haes&Van Grembergen, 2006	x		x	x		
	Portfolio management (incl. Information economics)	Parker et al., 1998; ; De Haes&Van Grembergen, 2006	x	x	x	x	x	x
	Charge back arrangements (ABC)	Weill&Ross, 2004; ; De Haes&Van Grembergen, 2006	x					
	Service Level Agreements	Weill&Ross, 2004; Van Grembergen et al., 2003; De Haes&Van Grembergen, 2006	x		x			x
	COBIT	ITGI, 2005; De Haes&Van Grembergen, 2006		x				
Relational Mechanisms	Job-rotation	Luftman, 2000; Reich&Benbasat, 2000; De Haes&Van Grembergen, 2006	x			x	x	
	Co-location	Luftman, 2000; Reich&Benbasat, 2000; De Haes&Van Grembergen, 2006	x					
	Cross-training	Luftman, 2000; Reich&Benbasat, 2000; De Haes&Van Grembergen, 2006			x	x		
	Knowledge management (on IT governance)	Weill&Ross, 2004; Luftman, 2000; Reich&Benbasat, 2000; De Haes&Van Grembergen, 2006	x			x		
	Business/IT account managers	Luftman, 2000; Reich&Benbasat, 2000; De Haes&Van Grembergen, 2006			x	x		
	Senior management giving the good example	De Haes&Van Grembergen, 2006	x					
	Informal meetings between business and IT senior management	De Haes&Van Grembergen, 2006					x	
	IT leadership	Monnoyer&Willmott, 2005; Smith, 2006						

A lot of qualitative feedback was captured from the respondents, including suggestions for new practices, improvements for definitions etc. All incoming data was structured and analysed by the researchers, resulting in a new and extended list of practices, as visualised in Table 2. Specific structures that were added are "(IT) audit committee at the level of the board of directors," "IT expertise at the level of board of directors," "IT governance function/officer," "security/risk/compliance officer," "IT project steering committee," and "IT security steering committee". IT governance processes that were added are "IT governance assurance – self assessment", "project governance/management methodologies," IT budget control and reporting," "benefits management and reporting," and "COSO/ERM." Finally, some relational mechanisms were added, more specifically "corporate internal communication addressing IT on a regular basis" and "IT governance awareness campaigns." Based on the feedback received from the respondents, short definitions were developed for each of these new practices. The updated list of practices was used as basis to start up survey round 2 and 3.

Delphi Round 2 and 3 — Evaluating IT Governance Practices

As mentioned in previous sections, goal of the Delphi survey rounds 2 and 3 was to capture input from the respondents regarding perceived effectiveness, perceived ease of implementation and a minimum baseline of IT governance practices. As visualised in Figure 3 and Figure 4, the research demonstrated that, according to the expert group, some of the addressed practices are more effective or easy to implement compared to others. The five practices being perceived as to most effective for the Belgian financial services sector are "IT steering committees," "CIO reporting to the CEO/COO," "CIO on executive committee," "IT budget control and reporting," and "portfolio management." All these practices were also identified as being relatively easy to implement. Other practices were perceived as fairly effective but not easy to implement. Good examples in this high-effectiveness/low ease of implementation domain are "benefits management and reporting" and "charge back arrangements."

An interesting case is the "IT governance framework COBIT." This framework is receiving a lot of attention in literature and in the field but did not come out very high in this research. However, there are indications that COBIT is a very solid framework to work with. COBIT, as a framework, is situated at a higher level of granularity compared to other more detailed structures and processes in this research. Good examples are the " IT steering committee," the "portfolio management process" and "project management/governance methodologies," which are all practices that are integral part of COBIT's "Planning and Organisation" processes [ITGI, 2005]. The good news for COBIT is that many of these detailed practices, individually, received very positive scores in this research in terms of effectiveness.

Table 2. Validated List of IT Governance Practices

	Index	IT Governance Practice	Definition
IT governance structures	S1	IT strategy committee at level of board of directors	Committee at level of board of directors to ensure IT is regular agenda item and reporting issue for the board of directors
	S2	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
	S3	(IT) audit committee at level of board of directors	Indepent committee at level of board of directors overviewing (IT) assurance activities
	S4	CIO on executive committee	CIO is a full member of the executive committee
	S5	CIO (Chief Information Officer) reporting to CEO (Chief Executive Officer) and/or COO (Chief Operational Officer)	CIO has a direct reporting line to the CEO and/or COO
	S6	IT steering committee (IT investment evaluation / prioritisation at executive / senior management level)	Steering committee at executive or senior management level responsible for determining business priorities in IT investments.
	S7	IT governance function / officer	Function in the organisation responsible for promoting, driving and managing IT governance processes
	S8	Security / compliance / risk officer	Function responsible for security, compliance and/or risk, which possibly impacts IT
	S9	IT project steering committee	Steering committee composed of business and IT people focusing on prioritising and managing IT projects
	S10	IT security steering committee	Steering committee composed of business and IT people focusing on IT related risks and security issues
	S11	Architecture steering committee	Committee composed of business and IT people providing architecture guidelines and advise on their applications.
	S12	Integration of governance/alignment tasks in roles&responsibilities	Documented roles&responsibilities include governance/alignment tasks for business and IT people (cf. Weill)
IT governance processes	P1	Strategic information systems planning	Formal process to define and update the IT strategy
	P2	IT performance measurement (e.g. IT balanced scorecard)	IT performance measurement in domains of corporate contribution, user orientation, operational excellence and future orientation
	P3	Portfolio management (incl. business cases, information economics, ROI, payback)	Prioritisation process for IT investements and projects in which business and IT is involved (incl. business cases)
	P4	Charge back arrangements - total cost of ownership (e.g. activity based costing)	Methodology to charge back IT costs to business units, to enable an understanding of the total cost of ownership
	P5	Service level agreements	Formal agreements between business and IT about IT development projects or IT operations
	P6	IT governance framework COBIT	Process based IT governance and control framework
	P7	IT governance assurance and self-assessment	Regular self-assessments or indepent assurance activities on the governance and control over IT
	P8	Project governance / management methodologies	Processes and methodologies to govern and manage IT projects
	P9	IT budget control and reporting	Processes to control and report upon budgets of IT investments and projects
	P10	Benefits management and reporting	Processes to monitor the planned business benefits during and after implementation of the IT investments / projects.
	P11	COSO / ERM	Framework for internal control
IT governance relational mechanisms	R1	Job-rotation	IT staff working in the business units and business people working in IT
	R2	Co-location	Physically locating business and IT people close to each other
	R3	Cross-training	Training business people about IT and/or training IT people about business
	R4	Knowledge management (on IT governance)	Systems (intranet, …) to share and distribute knowledge about IT governance framework, responsibilities, tasks, etc.
	R5	Business/IT account management	Bridging the gap between business and IT by means of account managers who act as in-between
	R6	Executive / senior management giving the good example	Senior business and IT management acting as "partners"
	R7	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. (eg. during informal lunches)
	R8	IT leadership	Ability of 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 organisation
	R9	Corporate internal communication addressing IT on a regular basis	Internal corporate communication regularly addresses general IT issues.
	R10	IT governance awareness campaigns	Campaigns to explain to business and IT people the need for IT governance

Another interesting finding to pinpoint is that many IT governance definitions stress the prime responsibility of the board of directors in IT governance [e.g. ITGI 2003], while these results reveal that the mechanisms to achieve this ("IT expertise at level of board of directors" and "IT strategy committee") are rated relatively low in terms of perceived effectiveness. This can possibly be explained by the fact that making the board of directors more IT literate is not easy to achieve, which is confirmed by the second to last score in term of ease of implementation of "IT expertise at the level of the board of directors." The results of this research in any way raise questions on how financial services organisations realise this board involvement in practice.
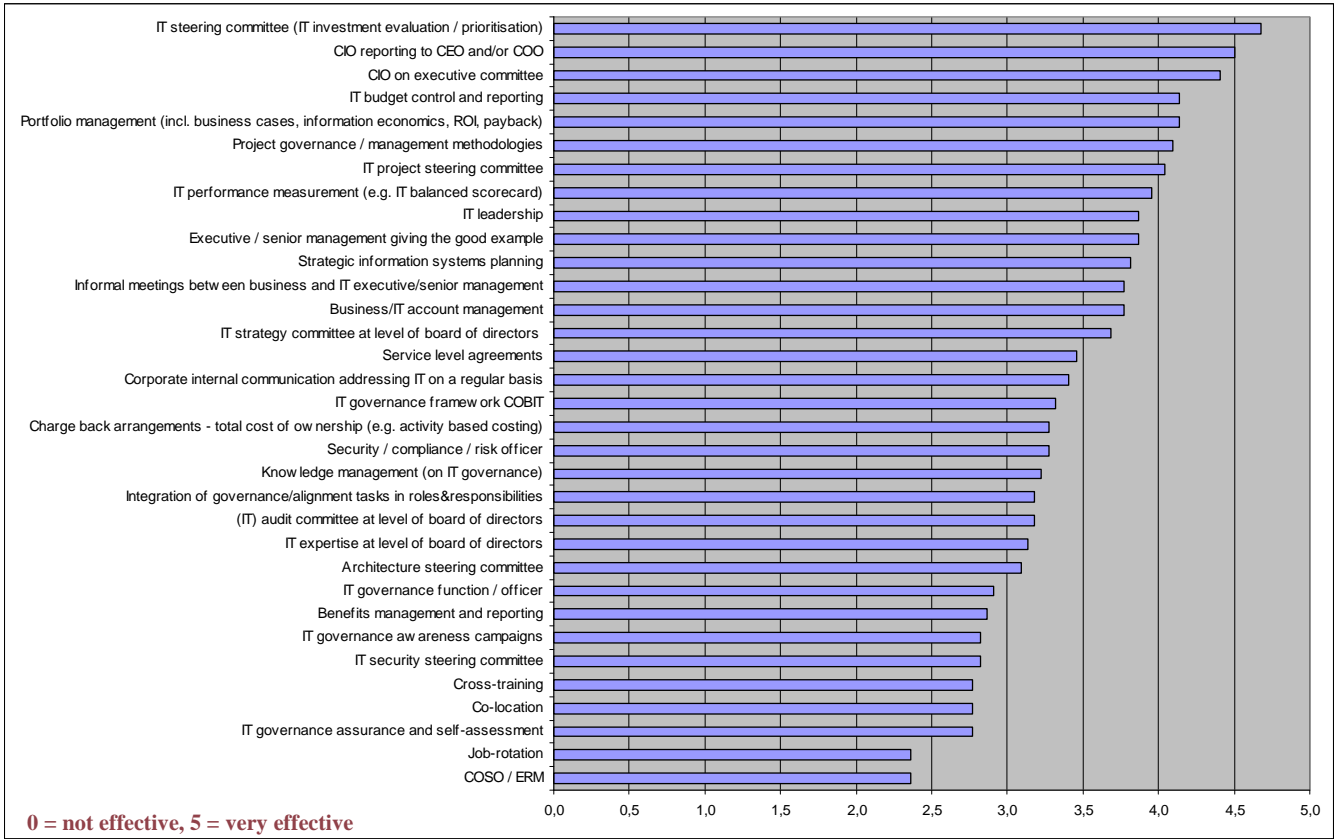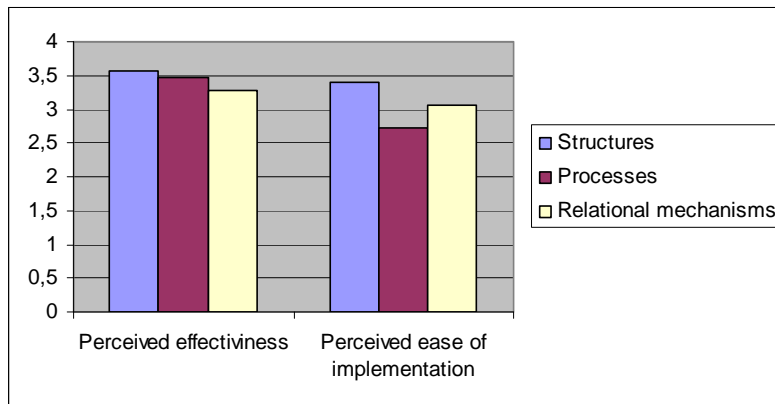
Figure 3. Perceived Effectiveness of IT Governance Practices
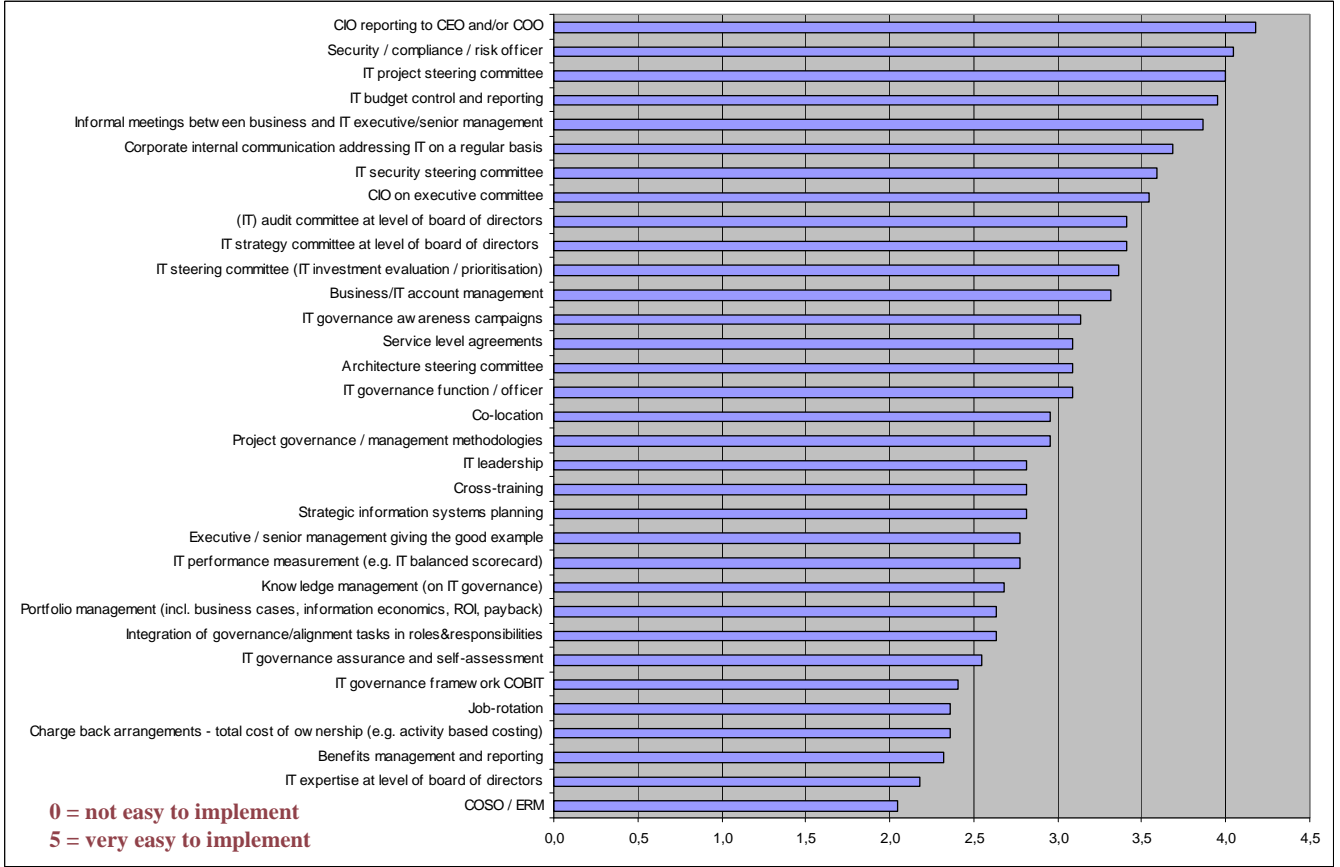
Figure 4. Perceived Ease of Implementation of IT Governance Practices

If averages are calculated for effectiveness and ease of implementation for all the structures, the processes and the relational mechanisms (see Figure 5), it appears that structures and processes are in general perceived as being equally effective. However, it appears that IT governance structures are perceived as being easier to implement compared to IT governance processes, although in many cases they are closely related. A good example here is the "IT steering committee," which is a crucial element to build up a "portfolio management" process, but the IT steering committee is perceived as much easier to implement compared to the whole portfolio management process. This finding is also supported by the personal experiences of the researchers in running an IT governance business game among groups of business and IT professionals. The participants in this game are confronted with a fictitious organisation with low business/IT alignment and the assignment is to define IT governance practices for the organisation to improve that situation. Mostly, the participants are very fast in defining structures such as steering committees, but it appears to be a much bigger challenge to define supporting IT governance processes such as portfolio management.

Figure 5 also shows that relational mechanisms are perceived as being easier to implement compared to IT governance processes, probably because some relational mechanisms can have a very informal character (e.g. "Informal meetings between business and IT executive/senior management").

Figure 5. Average Perceived Effectiveness and Ease of Implementation for IT Governance Structures, Processes and Relational Mechanisms

The Delphi research also brought up a list of IT governance practices, specifically for the Belgian financial services sector, that can be regarded as a minimum baseline, or a necessary set of practices for implementing IT governance. The respondents were asked to build up this minimum baseline in terms of a top-10 of practices, taking the attributes of perceived effectiveness and ease of implementation into account, together with their professional experience of their day-to-day practice. Table 3 shows the final top-10 resulting from this ranking exercises, including the number of times a specific practice is mentioned (total times mentioned) and the total ranking score (if a practice was ranked 1, it received 10 points).

Table 3. Minimum Baseline of IT Governance Practices

		total times mentioned	total ranking score	Total rank
S6	IT steering committee (IT investment evaluation / prioritisation at executive / senior management level)	21	178	1
S4	CIO on executive committee	20	153	2
P3	Portfolio management (incl. business cases, information economics, ROI, payback)	20	142	3
P9	IT budget control and reporting	17	112	4
S1	IT strategy committee at level of board of directors	17	97	5
R8	IT leadership	16	79	6
P1	Strategic information systems planning	13	64	7
S9	IT project steering committee	13	55	8
S5	CIO (Chief Information Officer) reporting to CEO (Chief Executive Officer) and/or COO (Chief Operational Officer)	11	47	9
P8	Project governance / management methodologies	14	45	10

It was surprising that only one relational mechanism was reported in this minimum baseline ("IT leadership"), while many authors in literature stress that the relational mechanisms are crucial enablers for IT governance [Keill et al. 2002; Weill and Broadbent 1998; Henderson and Venkatraman 1993]. A possible explanation is that, just as in literature, less-detailed knowledge and expertise is available on relational mechanisms which often have a more intangible and informal character. On the other hand, it should be noted that many other relational mechanism, such as "business/IT account management," "senior management giving the good example," and "informal meeting between business and IT executive/senior management," did attain relatively positive scores in terms of effectiveness and ease of implementation.

Figure 6 brings it all together, plotting the previous results on two axes. The vertical axe addresses the "perceived effectiveness" while the horizontal axe measures the "perceived ease of implementation." Starting from these quadrants, we are of course interested in the practices that are situated at the top right level, or at least above the horizontal axe. The practices in the grey circle are the ones identified as being a minimum baseline for IT governance. They all have "high effectiveness" and are "easy to implement" which demonstrates the consistency in answers of the experts. These minimum baseline practices are to be regarded as a minimal (necessary) set of IT governance practices for each Belgian financial services organisation. They should be supplemented with other practices as required by the specific environment to build up a more broad IT governance framework as required by the specific organisational environment. To create such a broader IT governance framework, the practices in the upper right quadrant (outside the circle) are first in scope to be regarded as additional elements, as they are "highly effective" and "easy to implement." Some examples are an "IT governance function/officer," "service level agreements," and "co-location." The practices at the top left are highly effective but do require more implementation time. Interesting to see is that the "IT governance framework COBIT" sits in this space, but as already mentioned earlier, COBIT is a framework situated at a higher level of granularity compared to the other practices, which evidently explains that is it harder to implement. IT governance practices that are situated at the bottom left of this graphical layout are of course the least interesting IT governance practices. In this quadrant, "COSO/ERM" and "job rotation" is located. The value of these practices, in the context of IT governance, can of course be challenged.
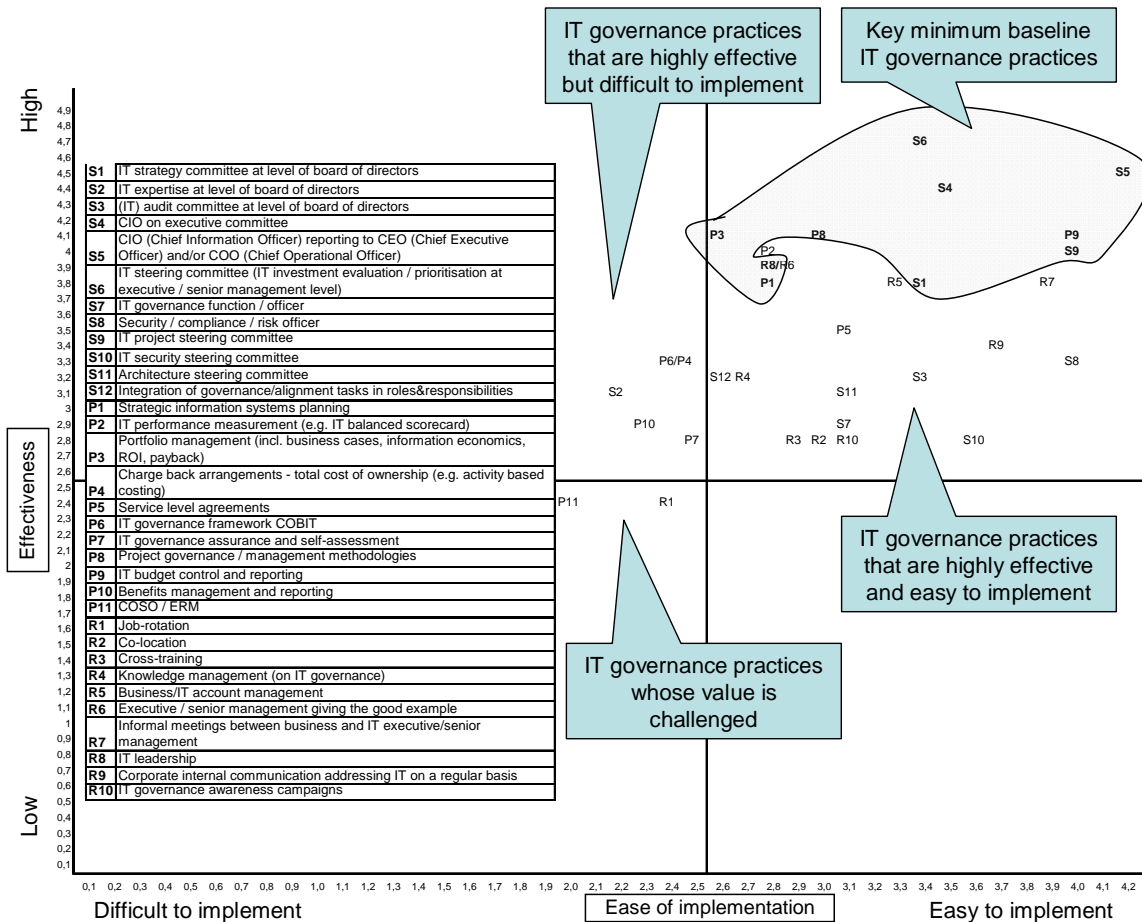
Figure 6. Effectiveness, Ease of Implementation and Minimum Baseline of IT Governance Practices

V. CONCLUSIONS AND FURTHER RESEARCH

At the beginning of this paper, four specific research questions were proposed. These conclusions are organised according to these research questions.

Regarding the first research question, this practice-oriented research reveals that Belgian financial services organisations are using (according the pilot cases) or can use (according the Delphi experts) a wide range of structures, processes and relational mechanisms in order to implement IT governance. This research reveals a list of 33 IT governance practices at level of strategic and executive/senior business and IT management. It should be noted that this list can not be exhaustive and the practices at operational level are discarded in this research.

In relation to research questions 2 and 3, the research demonstrates that some of the addressed practices are regarded as being more effective and/or easier to implement as others. Examples of practices that are perceived to be very effective are steering committees and having the CIO reporting to the CEO or being a member of the full executive committee. Other practices are perceived as fairly effective but not easy to implement. A good example of that is the IT governance framework COBIT. Finally, some practices are perceived as being not very effective nor easy to implement in the context of IT governance, such as COSO/ERM and job rotation. These practices are likely less useful in the creation of a powerful IT governance framework for an organisation.

Regarding research question 4, this paper also brought up a list of IT governance practices, specifically for the Belgian financial services sector, that can be regarded as a minimum baseline for IT governance. This suggests that, in implementing IT governance within a financial services organisation, these minimum baseline mechanisms may play an important role (necessary conditions). Of course, they should be supplemented with other practices as required by the specific environment, culture, etc. of the organisation, to create a broader set of IT governance practices.

While this research for validity reasons is focused on the Belgian financial services sector only, it can be expected that many conclusions might apply to other sectors as well. Further research, focusing on other sectors could support that assumption. Such research in other sectors could also address the impact of other contingencies. It might for example be that organisations operating in the United States have very different views on what an optimal IT governance framework is compared to organisations operating in Europe.

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EDITOR'S NOTE: The following reference list contains the address of World Wide Web pages. Readers, who have the ability to access the Web directly from their computer or are reading the paper on the Web, can gain direct access to these references. Readers are warned, however, that:

1. These links existed as of the date of publication but are not guaranteed to be working thereafter.
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Delphi Round 1 Questionnaire

IT governance structures, processes and relational mechanisms for Belgian financial services sector	
STEP 1 **personal data**	**Instruction:** Please do provide some **personal data** about your function and the company you work for. This information will only be used by the researchers in order to better understand and interpret the results.

Name	
Function name	
Profile *(business, IT, consultant, audit)*	
Company	
# Employees in Belgium *(less than 100, between 100 - 1000, more than 1000)*	

| **STEP 2**
input on IT governance practices | **Instruction 1:**
The list below provides practices that an organisation can use to implement IT governance at the level of the board of directors, executive management and senior management, categorised in three domains: structures, processes and relational mechanisms.
Review the list of proposed IT governance structures, processes and relational mechanisms **for completeness** and add, if needed, additional practices in one of the three categories. Include a definition if possible.

notes:
1. the list is based on literature and exploratory case research
2. for each of the practices, move over the red triangles (top right of each cell) for a definition |

	IMPORTANT NOTES **- Please do not complete this survey for your own specific environment. Complete the survey for a generic mid to large size (>100 employees) organisation operating in the financial services sector in Belgium.** **- The focus of this research is on IT governance practices at the level of the board of directors, executive management and senior management. Please do not focus on more operational oriented structures, processes and relational mechanisms.**

IT governance structures		
	S1	Integration of governance/alignment tasks in roles&responsibilities
	S2	IT steering committee(s) (executive / senior management level)
	S3	IT strategy committee (board of directors level)
	S4	CIO on Executive Committee
	S5	CIO reporting to CEO
	S6	Architecture Committee
	S6	*<add new if required>* · *<add definition if possible>*
	S7	*<add new if required>* · *<add definition if possible>*
	S8	*<add new if required>* · *<add definition if possible>*

IT governance processes		
	P1	Strategic information systems planning
	P2	Balanced scorecard
	P3	Portfolio management (incl. Information economics, ROI, payback)
	P4	Charge back arrangements (e.g. Activity Based Costing)
	P5	Service Level Agreements
	P6	IT governande framework COBIT
	P7	*<add new if required>* · *<add definition if possible>*
	P8	*<add new if required>* · *<add definition if possible>*
	P9	*<add new if required>* · *<add definition if possible>*

IT governance relational mechanisms		
	R1	Job-rotation
	R2	Co-location
	R3	Cross-training
	R4	Knowledge management (on IT governance)
	R5	Business/IT account managers
	R6	Executive / senior management giving the good example
	R7	Informal meetings between business and IT executive/senior management
	R8	IT leadership
	R9	*<add new if required>* · *<add definition if possible>*
	R10	*<add new if required>* · *<add definition if possible>*
	R11	*<add new if required>* · *<add definition if possible>*

| **STEP 3**
feedback | **Instruction:**
Provide any additional feedback / comments. |

Delphi Round 2 Questionnaire

IT governance structures, processes and relational mechanisms for Belgian financial services sector

IMPORTANT NOTES
- Please do not complete this survey for your own specific environment. Complete the survey for a generic mid to large size (>100 employees) organisation operating in the financial services sector in Belgium.
- The focus of this research is on IT governance practices at the level of the board of directors, executive management and senior management, not on more operational oriented practices
- After the previous survey round, the list of IT governance practices was enriched and is frozen now. No new practices can be added anymore. Feedback on wording and definitions is possible in STEP 2 of the survey form.

STEP 1 input on IT governance practices

Click on the red triangle on the top right of each cell for a definition of the IT governance practice.

Instruction 1: Rate the "**perceived effectiveness**" of **ALL** the structures, processes and relational mechanisms for a generic Belgian financial services organisation, using a score b**etween 0 (not effective) and 5 (very effective).**

Instruction 2: Rate the "**perceived ease of implementation**" of **ALL** the structures, processes and relational mechanisms for a generic Belgian financial services organisation, using a score **between 0 (not easy) and 5 (very easy).**

Instruction 3: Taken the previous attributes (effectiveness - easy of implementation) and your personal experience into account, provide the **top 10 most important IT governance practices,** which are in your opinion crucial elements or a **minimum baseline of an optimal IT governance mix** for a generic Belgian financial services organisation.Give the most important practice score 1, the second most important score 2, ... the 10th most important score 10.

IT governance structures

		Instr 1	Instr 2	Instr 3
S1	IT strategy committee at level of board of directors level			
S2	IT expertise at level of board of directors			
S3	IT audit committee at level of board of directors			
S4	CIO on executive committee			
S5	CIO (Chief Information Officer) reporting to CEO (Chief Executive Officer) and/or COO (Chief Operational Officer)			
S6	IT steering committee (IT investment evaluation / prioritisation at executive / senior management level)			
S7	IT governance function / officer			
S8	Security / compliance / risk officer			
S9	IT project steering committee			
S10	IT security steering committee			
S11	Architecture steering committee			
S12	Integration of governance/alignment tasks in roles&responsibilities			

IT governance processes

		Instr 1	Instr 2	Instr 3
P1	Strategic information systems planning			
P2	IT performance measurement (e.g. IT balanced scorecard)			
P3	Portfolio management (incl. business cases, information economics, ROI, payback)			
P4	Charge back arrangements - total cost of ownership (e.g. activity based costing)			
P5	Service level agreements			
P6	IT governande framework COBIT			
P7	IT governance assurance and self-assessment			
P8	Project governance / management methodologies			
P9	IT budget control and reporing			
P10	Benefits management and reporting			
P11	COSO / ERM			

IT governance relational mechanisms

		Instr 1	Instr 2	Instr 3
R1	Job-rotation			
R2	Co-location			
R3	Cross-training			
R4	Knowledge management (on IT governance)			
R5	Business/IT account management			
R6	Executive / senior management giving the good example			
R7	Informal meetings between business and IT executive/senior management			
R8	IT leadership			
R9	Corporate internal communication addressing IT on a regular basis			
R10	IT governance awareness campaigns			

STEP 2 feedback

Instruction: Provide any additional feedback / comments.

Delphi Round 3 Questionnaire

IT governance structures, processes and relational mechanisms for Belgian financial services sector

IMPORTANT NOTES
- Please do not complete this survey for your own specific environment. Complete the survey for a generic mid to large size (>100 employees) organisation operating in the financial services sector in Belgium.
- The focus of this research is on IT governance practices at the level of the board of directors, executive management and senior management, not on more operational oriented practices

STEP 1
re-evaluate your scores

INSTRUCTION 1
Considering the group's average, re-evaluate your rating for the PERCEIVED EFFECTIVENESS of IT governance practices for a generic Belgian financial services organisation. (0 =not effective, 5 = very effective)

INSTRUCTION 2
Considering the group's average, re-evaluate your rating for the EASE OF IMPLEMENTATION of IT governance practices for a generic Belgian financial services organisation, (0 =not easy to implement, 5 = very easy to implement)

INSTRUCTION 3
Considering the group's average, re-evaluate your top 10 most important IT governance practices, which are in your opinion crucial elements or a minimum baseline of an optimal IT governance mix for a generic Belgian financial services organisation. Give the most important practice score 1, the second most important score 2, ... the 10th most important score 10.

Click on the red triangle on the top right of each cell for a definition of the IT governance practice.

		your rating	group's average	delta	new rating	your rating	group's average	delta	new rating	your ranking	group's average	delta	new ranking
IT governance structures	S1 IT strategy committee at level of board of directors	2	3,9	-1,9		2	3,6	-1,6			6	-6	
	S2 IT expertise at level of board of directors	2	3,3	-1,3		2	2,5	-0,5			16	-16	
	S3 (IT) audit committee at level of board of directors	2	3,6	-1,6		3	3,6	-0,6			17	-17	
	S4 CIO on executive committee	3	4,6	-1,6		0	3,9	-3,9			3	-3	
	S5 CIO (Chief Information Officer) reporting to CEO (Chief Executive Officer) and/or COO (Chief Operational Officer)	5	4,8	0,2		5	4,7	0,3		2	9	-7	
	S6 IT steering committee (IT investment evaluation / prioritisation at executive / senior management level)	4	4,9	-0,9		3	4,1	-1,1		1	1	0	
	S7 IT governance function / officer	4	3,2	0,8		4	3,4	0,6			19	-19	
	S8 Security / compliance / risk officer	5	3,8	1,2		4	4,4	-0,4			20	-20	
	S9 IT project steering committee	5	4,4	0,6		4	4,5	-0,5			7	-7	
	S10 IT security steering committee	5	3,1	1,9		4	3,9	0,1			23	-23	
	S11 Architecture steering committee	5	3,4	1,6		4	3,5	0,5		5	18	-13	
	S12 Integration of governance/alignment tasks in roles&responsibilities	3	3,6	-0,6		3	2,8	0,2			13	-13	
IT governance processes	P1 Strategic information systems planning	3	4,3	-1,3		1	3,1	-2,1		3	8	-5	
	P2 IT performance measurement (e.g. IT balanced scorecard)	4	4,4	-0,4		4	3,1	0,9			11	-11	
	P3 Portfolio management (incl. business cases, information economics, ROI, payback)	3	4,6	-1,6		2	2,9	-0,9		4	2	2	
	P4 Charge back arrangements - total cost of ownership (e.g. activity based costing)	3	3,5	-0,5		2	2,6	-0,6			25	-25	
	P5 Service level agreements	3	3,7	-0,7		3	3,6	-0,6			12	-12	
	P6 IT governance framework COBIT	3	3,6	-0,6		3	2,7	0,3		6	14	-8	
	P7 IT governance assurance and self-assessment	3	3,1	-0,1		1	2,8	-1,8			26	-26	
	P8 Project governance / management methodologies	4	4,5	-0,5		3	3,4	-0,4		10	9	1	
	P9 IT budget control and reporting	4	4,4	-0,4		4	4,5	-0,5		7	4	3	
	P10 Benefits management and reporting	2	3,1	-1,1		1	2,6	-1,6			28	-28	
	P11 COSO / ERM	3	2,5	0,5		1	2,2	-1,2			31	-31	
IT governance relational mechanisms	R1 Job-rotation	3	2,7	0,3		3	2,8	0,2			27	-27	
	R2 Co-location	3	3,2	-0,2		3	3,5	-0,5			31	-31	
	R3 Cross-training	3	3,2	-0,2		2	3,3	-1,3			31	-31	
	R4 Knowledge management (on IT governance)	3	3,5	-0,5		2	3,1	-1,1			30	-30	
	R5 Business/IT account management	3	4,1	-1,1		4	3,8	0,2		8	15	-7	
	R6 Executive / senior management giving the good example	3	4,3	-1,3		3	3,2	-0,2			20	-20	
	R7 Informal meetings between business and IT executive/senior management	3	4,0	-1,0		4	4,4	-0,4			28	-28	
	R8 IT leadership	4	4,3	-0,3		4	3,3	0,7		9	4	5	
	R9 Corporate internal communication addressing IT on a regular basis	4	3,8	0,2		4	3,9	0,1			23	-23	
	R10 IT governance awareness campaigns	2	3,2	-1,2		3	3,5	-0,5			20	-20	

STEP 2
feedback

Instruction:
Provide any additional feedback / comments.