Rôle de la gouvernance des TI dans la création de la valeur des TI pour l'organisation

Thèse

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RÉSUMÉ

Les investissements octroyés au domaine des TI par les organisations sont de plus en plus importants. Ils représentent dans certaines industries plus de 6 % du revenu de l'organisation (Gartner, 2014a). Paradoxalement, plusieurs organisations arrivent difficilement à générer un bon retour sur leur investissements TI à cause d'un contrôle déficient ou d'une mauvaise prise de décision sur ces mêmes investissements (IT Governance Institute, 2008). En revanche, les entreprises qui réussissent s'efforcent à éviter ces manquements par la mise en place d'une gouvernance des TI efficace. L'existence d'une relation positive entre la gouvernance des TI et la performance organisationnelle a été mise en évidence par quelques recherches antérieures. En l'occurrence, Weill et Ross (2004) soulignent que les entreprises dotées d'une gouvernance des TI efficace enregistrent un rendement de leur investissements TI supérieur de 40% aux autres (Weill & Ross, 2004). Cependant, ces études n'expliquent pas comment la gouvernance des TI serait liée à la performance de l'organisation. Dans cette thèse, nous avons cherché à clarifier conceptuellement et empiriquement cette relation en proposant dans un premier temps une conceptualisation théorique de cette relation qui se trouve fondée sur la perspective des capacités dynamiques (Article #1). Les apprentissages conceptuels issus du premier article ont été exploités par la suite pour développer et tester empiriquement un modèle théorique de l'influence de la gouvernance des TI sur la contribution des TI à la performance organisationnelle (Article #2). Finalement, une étude qualitative de l'importance accordée aux parties prenantes externes dans la gouvernance des TI a été menée (Article #3). Ce troisième article part du principe qu'une gouvernance des TI efficace, et qui se veut génératrice de la valeur pour l'organisation, doit prendre en considération toute partie prenante qui peut influencer la prise de décision TI de l'organisation, incluant les parties externes à l'organisation.

Mots-clés : gouvernance des TI, sophistication de gestion des TI, alignement stratégique des TI, contribution des TI à la performance organisationnelle, capacités dynamiques, parties prenantes externes, théorie des parties prenantes.

ABSTRACT

Investments allocated to IT by organisations are increasingly important. They represent in some industries more than 6% of the organisation's revenue (Gartner, 2014a). However, many organizations still fail to create value from their IT investments because of a lack of control or a poor decision making on these investments (IT Governance Institute, 2008). Successful enterprises strive to avoid these shortcomings through effective IT governance. The existence of a positive relationship between IT governance and organizational performance was highlighted by some previous research. For instance, Weill and Ross (2004) point out that companies with an effective IT governance tend to achieve 40 % better return from their IT investments than others. However, these studies do not explain how IT governance is related to the organisation's performance. In this thesis, we sought to clarify conceptually and empirically that relationship by offering initially a theoretical conceptualization of this relationship that is based on the dynamic capabilities perspective (article #1). Conceptual learning from the first article was subsequently exploited to develop and empirically test a theoretical model of IT governance influence on IT contribution to organizational performance (article #2). Finally, a qualitative study of the importance given to external stakeholders in IT governance was conducted (article #3). This third article assumes that effective IT governance that is able to achieve IT business value for the organization must consider every stakeholder that can influence the organization's IT decision-making, including the organization external stakeholders.

Keywords: IT governance, IT management sophistication, IT strategic alignment, IT contribution to organisational performance, dynamic capabilities, external stakeholders, stakeholder theory.

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AVANT-PROPOS

Cette thèse contribue à l'avancement de la connaissance dans le domaine de la gouvernance des technologies de l'information (TI) de l'organisation. Plus spécifiquement, deux principaux thèmes de recherche ont été couverts dans le cadre de cette thèse, à savoir : l'étude de l'impact de la gouvernance des TI sur la performance organisationnelle (Article #1 et Article #2), et l'étude de l'influence des parties prenantes externes sur la gouvernance des TI de l'organisation (Article #3). Il s'agit respectivement des chapitres 2, 3 et 4 de la thèse. Le chapitre 1 introduit quant à lui la thèse et présente un résumé i.e. base théorique, approche méthodologique et contributions de chacun des articles.

Le chapitre 2 (i.e. Article # 1) constitue un article conceptuel et présente plus spécifiquement les bases théoriques d'un cadre conceptuel que nous proposons pour mieux comprendre la relation qui lie la gouvernance des TI à la performance organisationnelle. Ce chapitre a généré deux actes de conférences : l'un à l'ASAC (*la Conférence de l'association des sciences administratives du Canada, 2013*) et l'autre, à l'IBIMA (*the International Business Information Management Conference, 2013*). Il a aussi été soumis à la revue *Communication of the International Information Management Association* (*CIIMA*).

Le chapitre 3 (i.e. Article # 2) représente le volet opératoire du cadre conceptuel présenté dans l'Article # 1 de la thèse et propose de tester empiriquement un modèle conceptuel qui examine l'impact de la gouvernance des TI sur la contribution des TI à la performance organisationnelle. Ce chapitre a généré un acte de conférence à ECMLG (*European Conference on Management Leadership and Governance, Zagreb, Republic of Croatia, 2014*). Il a aussi été soumis à la revue *Journal of Global Information Management*.

Enfin, le chapitre 4 (i.e. Article #3) traite empiriquement de l'influence des parties prenantes externes sur la gouvernance des TI. Ce chapitre a généré un acte de conférence à MCIS (*Mediterranean Conference on Information Systems, 2014*). Il a aussi été soumis à la revue *Information Technology & People*.

Les références de ces articles sont :

Harguem Saida, Karuranga Égide, «Impact de la Gouvernance des TI sur la performance organisationnelle : proposition d'un cadre conceptuel » Actes de la Conférence de l'association des sciences administratives du Canada (ASAC), 33(5), Calgary, Alberta, 2013. Soumis à *CIIMA*

Harguem Saida, Karuranga Égide, Mellouli Sehl, «Impact of IT Governance on organizational performance: Proposing an Explanatory Model», 10th European conference on Management Leadership and Governance (ECMLG), Zagreb, Republic of Croatia, 2014. Soumis à *Journal of Global Information Management*.

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Comme premier auteur, j'ai entièrement contribué à la conception et la réalisation des différents articles de cette thèse incluant la revue de littérature, les questions de recherche, les cadres théoriques et modèles conceptuels, la collecte des données et l'analyse des résultats. Mes co-auteurs ont contribué par leurs commentaires et suggestions à améliorer la qualité de ces articles.

CHAPITRE I – INTRODUCTION

Les technologies de l'information (TI) représentent un important secteur d'investissement dans le monde des affaires d'aujourd'hui. Selon Gartner (2014b), les dépenses mondiales liées aux TI ont excédées les 3.6 trillons de $ en 2013. Selon ces mêmes prévisions, ces dépenses vont continuer à croitre au terme de l'année 2014 pour atteindre un taux prévisionnel de 2.6% et 3.7% en 2015 (Gartner, 2014b). Face à la croissance significative des investissements TI, les organisations se retrouvent plus que jamais confrontées à un grand défi, celui de maximiser leur valeur pour les affaires. Or, pour générer de la valeur, les TI doivent être reconnus comme un actif stratégique pour l'organisation (IT Governance Institute, 2008; Weill & Ross, 2004). Par conséquent, la fonction TI ne peut plus être traitée comme une entité distincte de l'entreprise tel un centre de coûts (Hoving, 2010). La haute direction et les conseils d'administration ont besoin d'étendre la gouvernance au domaine des TI et établir des normes de haut niveau qui déterminent comment les TI doivent être utilisées par l'organisation pour rencontrer ses objectifs d'affaires (IT Governance Institute, 2008). Plus spécifiquement, la gouvernance des TI « englobe le pilotage, les structures organisationnelles et les processus grâce auxquels les TI soutiennent et prolongent les stratégies et objectifs d'affaires de l'organisation » (IT Governance Institute, 2008).

Objectifs de la thèse

La littérature sur la gouvernance des TI s'est largement intéressée aux pratiques et mécanismes qui contribuent à la mise en œuvre d'une gouvernance des TI efficace. De même que d'examiner l'impact de la gouvernance des TI sur l'alignement stratégique des TI avec les besoins d'affaires. Toutefois, très peu de recherches se sont intéressées à étudier de plus près l'effet de la gouvernance des TI sur la performance organisationnelle. Bien que la présence d'un effet positif de la gouvernance des TI sur la performance des organisations est noté dans certaines recherches antérieures, le comment de cette relation d'influence reste vague et très peu étudié. Cette thèse s'inscrit dans cette perspective. Elle vise comme **premier objectif** à étudier de plus près la relation qui lie la gouvernance des TI à la performance organisationnelle. Plus spécifiquement, les articles #1 et #2 de la thèse lui sont dédiés. Dans le premier article, nous cherchons à répondre à la question de recherche

suivante : *Comment la gouvernance des TI est-elle liée à la performance organisationnelle ?* Pour y répondre une conceptualisation de la relation est proposée et se trouve fondée théoriquement sur la perspective des capacités dynamiques. Nous appliquons les apprentissages conceptuels issus de ce premier article pour étudier empiriquement cette relation dans l'article #2 de la thèse et répondre plus spécifiquement à la question suivante : *Comment la gouvernance des TI contribue-t-elle à la performance organisationnelle ?*

Cette thèse poursuit également un **second objectif** celui de déterminer la place qu'occupe les parties prenantes externes dans la gouvernance des TI. La gouvernance des TI constitue une partie intégrante de la gouvernance d'entreprise (IT Governance Institute, 2003; Peterson, 2004). En plus d'être une démarche qui repose sur la mise en œuvre de bonnes pratiques, elle spécifie le cadre des responsabilités et droits décisionnels relatifs à la gestion des différentes activités TI de l'organisation (Weill & Ross, 2004). Plus spécifiquement, la gouvernance des TI se trouve sous la responsabilité des membres du conseil d'administration et des exécutifs de l'organisation. Ses activités et les rôles qui leur sont liés sont généralement pris en charge par les exécutifs et le personnel de gestion dans presque toutes les unités et fonctions de l'organisation (IT Governance Institute, 2008). La littérature en systèmes d'information s'est largement intéressée à cet aspect structurel de la gouvernance des TI. Nous retrouvons ainsi une prédominance des recherches qui analysent la façon dont la gouvernance des TI est déployée dans les organisations en identifiant les différentes parties prenantes à la gouvernance des TI et la façon dont le pouvoir décisionnel sur les activités TI est distribué. On constatera alors que les principales parties prenantes à la gouvernance des TI sont internes à l'organisation. Toutefois, nous savons que l'organisation n'évolue pas dans un vase clos mais qu'elle se trouve influencée par son environnement. Ceci nous mène à croire que les parties prenantes externes à l'organisation pourraient avoir une certaine influence sur la gouvernance des TI de l'organisation. L'article #3 de la thèse s'intéresse à cette problématique et répond plus particulièrement à la question de recherche suivante : *Quelles sont les parties prenantes externes qui sont considérées comme les plus importantes dans un contexte de gouvernance des TI ? Comment sont-elles priorisées ?*

Les deux objectifs poursuivis dans cette thèse sont complémentaires et contribuent à une meilleure compréhension du rôle de la gouvernance des TI dans la création de la valeur des TI pour l'organisation.

Structure de la thèse

La présente section est une introduction générale à la thèse. Elle introduit le thème de recherche couvert dans la thèse, les objectifs de recherche et la structure de la thèse. Les prochaines sous-sections présenteront un résumé, i.e. bases théoriques, approche méthodologique et contribution de chacun des articles. Suivront les trois articles de la thèse. D'abord, le premier article est présenté et porte sur la conceptualisation de la relation qui lie la gouvernance des TI à la performance organisationnelle, les assises théoriques de cette conceptualisation ainsi que sur différentes propositions de recherche. Par la suite, l'examen empirique de la relation qui lie la gouvernance des TI à la performance organisationnelle sera rapportée dans le second article de la thèse. L'article #3 explore quant à lui un volet complémentaire au sujet traité par l'article #1 et l'article #2 de cette thèse, en rapport avec la prise en compte des parties prenantes externes dans la gouvernance des TI, à savoir : l'importance accordée aux parties prenantes externes dans la gouvernance des TI compte tenu de l'influence qu'ils peuvent exercer dans ce cadre. Enfin, une conclusion générale de la thèse est présentée. Celle-ci consiste en une synthèse des résultats de la recherche, en une présentation des contributions de la recherche ainsi que de ses limites et la proposition de pistes de recherches futures.

RÉSUMÉ DES ARTICLES DE LA THÈSE

Article #1: The Impact of IT Governance on Organizational Performance: A Conceptual Framework Proposition

Cet article porte sur le développement d'un cadre conceptuel qui vise à proposer une explication théorique de l'impact de la gouvernance des TI sur la performance organisationnelle. Le cadre conceptuel proposé est motivé par une importante revue de littérature effectuée sur la gouvernance des TI. La revue de littérature qui a couvert la période de 1990 à 2015, est focalisée sur des revues académiques et conférences arbitrées. L'analyse de contenu des articles recensés a montré que leur objet de recherche pouvait être classé selon quatre principales catégories : 1) le design des structures de prise de décision TI; 2) le déploiement de la gouvernance des TI; 3) la mesure de la performance de la gouvernance des TI et 4) les conséquences de la gouvernance des TI. Bien que le résultat de cette revue a montré que les recherches sur la gouvernance des TI deviennent relativement nombreuses et diversifiées, ils ont également permis d'observer qu'il n'existe pas encore d'études proposant une conceptualisation théorique du lien entre la gouvernance des TI et la performance organisationnelle. Face à la rareté des recherches traitant de l'impact de la gouvernance des TI sur la performance organisationnelle, un cadre conceptuel a été développé pour tenter de répondre à la question de recherche suivante : *Comment la gouvernance des TI est-elle liée à la performance organisationnelle ?*

S'appuyant sur la perspective des capacités dynamiques, le cadre conceptuel proposé positionne la gouvernance des TI en tant que processus dynamique et stipule que l'efficacité des mécanismes de gouvernance des TI qui le compose contribue au développement et à l'évolution des capacités de gestion des TI de l'organisation (i.e. sophistication de gestion des TI). Le cadre conceptuel proposé stipule par ailleurs que la gouvernance des TI en tant que processus dynamique conduit à une meilleure performance organisationnelle quand les capacités de gestion des TI sont développées en harmonie avec la stratégie d'affaires de l'organisation, suggérant ainsi l'alignement stratégique comme une conséquence de la sophistication de gestion des TI et un déterminant d'une meilleure performance organisationnelle.

Base théorique

Le cadre conceptuel proposé dans cet article repose sur une assise théorique pour proposer une explication du lien entre la gouvernance des TI et la performance organisationnelle, soit une adaptation, pour le domaine des TI, de la perspective des capacités dynamiques. Ce fondement théorique est présenté comme une alternative à la théorie de la coordination qui est généralement adoptée comme fondement théorique par une bonne partie des recherches antérieures sur la gouvernance des TI, de façon implicite ou explicite (e.g. Sambamurthy & Zmud, 1999; Weill & Ross, 2004; Peterson, 2004; De HAes & Van Grembergen, 2008).

La perspective des capacités dynamiques est souvent considérée comme complémentaire à la théorie des ressources (Eisenhardt & Martin, 2000; Wang & Ahmed, 2007). En considérant la nature évolutive des ressources et des compétences détenues par l'organisation, la perspective des capacités dynamiques vient combler la nature statique de la théorie des ressources (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997; Wang & Ahmed, 2007). Teece et al. (1997) définissent les capacités dynamiques comment étant : «*Dynamic capabilities refer to the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments*». (p.517). Wang and Ahmed (2007) précisent que les capacités dynamiques sont inhérentes aux processus et sont spécifiques aux organisations. Elles présentent toutefois des caractéristiques communes susceptibles d'être partagées par les organisations. Ainsi, plusieurs recherches ont porté sur l'identification des fondements des capacités dynamiques en les situant par rapport aux autres ressources et compétences de l'organisation suivant un ordre hiérarchique (Ambrosini, Bowman, & Collier, 2009; Pavlou & El Sawy, 2011; Teece, 2007; Wang & Ahmed, 2007). À travers les différentes conceptualisations, il faut retenir que les capacités dynamiques font référence à des routines spécifiques qui régissent les changements appliqués aux capacités opérationnelles pour les garder aptes à répondre aux besoins de l'environnement (Collis, 1994). Elles conduisent également à une meilleure performance organisationnelle qui dure dans le temps (Pavlou & El Sawy, 2006; Teece, 2007; Wang & Ahmed, 2007).

Plusieurs raisons permettent de considérer la gouvernance des TI comme une capacité dynamique. Premièrement, il s'agit d'un processus dynamique continu dont l'objectif est

d'améliorer la valeur des TI pour les affaires (*IT business value*) (IT Governance Institute, 2008). Deuxièmement, le processus de gouvernance des TI régit les changements appliqués aux différentes ressources et capacités TI qui se trouvent à la base de la mesure de performance de la fonction TI dans son ensemble. Troisièmement, la gouvernance des TI représente une habilité de gestion qui se développe et dure dans le temps et dont le processus de réalisation repose sur un ensemble varié de mécanismes (structures, processus et mécanismes relationnels). Finalement, elle constitue un processus distinct du processus opérationnel de gestion des TI. À l'instar des capacités dynamiques différentes combinaisons des mécanismes qui y sont à l'appui sont susceptibles d'engendrer des cadres de gouvernance des TI différents.

La perspective des capacités dynamiques est donc utilisée dans cette thèse afin de décrire et mieux expliquer comment la gouvernance des TI est liée à la performance organisationnelle.

Approche méthodologique

Le premier article de la thèse qui se veut un article conceptuel, présente : (1) une importante revue de littérature qui a permis de cerner les principaux courants de recherche portant sur la gouvernance des TI et identifier la limite des recherches portant sur l'étude du lien entre la gouvernance des TI et la performance organisationnelle, (2) le développement d'un cadre conceptuel qui repose sur une synthèse de la littérature et qui se veut un modèle explicatif du lien entre gouvernance des TI et performance organisationnelle, (3) une description de l'assise théorique qui a régit la logique du cadre conceptuel, et finalement (4) un ensemble de propositions de recherche émanant du cadre conceptuel proposé.

La revue de littérature qui se trouve à la base de cet article a couvert la période de 1990 à 2015. Lors de la revue de littérature, des recherches dans les bases de données ABI/Inform (Proquest) et Business Source Complete (EBSCO) ont été effectuées à l'aide de mots clés tels que : *« Information technology governance, governance modes; IT decision-making structure; IT governance mechanisms; IT governance deployment; IT governance performance; IT governance framework; IT best practices* ». Une approche ascendante (*forward*) ainsi qu'une approche descendante (*backward*) ont été utilisées afin d'assurer

une plus grande couverture des articles clés dans le domaine de la gouvernance des TI (Webster & Watson, 2002).

Contribution Article #1

Les apports du premier article de la thèse sont multiples. Tout d'abord, cet article répond à un manque de recherches effectuées sur la relation entre la gouvernance des TI et la performance organisationnelle en proposant un modèle conceptuel qui présente une explication de ce lien. De plus, le recours à la perspective des capacités dynamiques comme fondement théorique pour expliquer comment se fait l'impact de la gouvernance des TI sur la performance organisationnelle constitue une première. Ainsi à travers cinq propositions de recherche nous postulons que la gouvernance des TI en tant que capacité dynamique amène une performance organisationnelle mais que ce lien est indirect et se trouve influencé par l'effet médiateur de la sophistication de gestion des TI et de l'alignement stratégique observé dans l'organisation. Par ailleurs, la conception théorique du modèle proposé suggère l'importance de la collaboration entre les responsables d'affaires et TI dans la mise en place des mécanismes de gouvernance des TI afin de permettre une sophistication de gestion des TI qui soit orientée par la stratégie d'affaires. Finalement, le modèle conceptuel proposé renforce l'idée de la gouvernance des TI en tant que processus dynamique continue qui nécessite un *monitoring* constant, sur une base régulière afin qu'une plus grande valeur des TI soit obtenue et maintenue dans le temps.

Article #2: Impact of IT Governance on Organizational Performance: Proposing an Explanatory Model

Le deuxième article de la thèse propose un modèle qui explique empiriquement la relation qui lie la gouvernance des TI à la performance organisationnelle. Plus spécifiquement, le modèle proposé se base sur la perspective des capacités dynamiques pour expliquer comment se fait la contribution de la gouvernance des TI à la performance organisationnelle. À travers ce modèle, nous considérons la gouvernance des TI comme une compétence des capacités dynamiques de l'organisation qui, à travers ses mécanismes, va affecter positivement la capacité de gestion des TI de l'organisation en la rendant plus sophistiquée (*IT management sophistication*), engendrant par le fait même un meilleur alignement stratégique des TI et conséquemment une meilleure contribution des TI à la performance organisationnelle. La question de recherche rattachée au deuxième article est la suivante : *Comment la gouvernance des TI contribue-t-elle à la performance organisationnelle* ?

Base théorique

La perspective des capacités dynamiques constitue une perspective complémentaire à la théorie des ressources. Elle vient combler les manquements attribués à la théorie des ressources. En effet, la théorie des ressources est jugée statique compte tenu de ses principes devenus incompatibles avec les caractéristiques de l'environnement d'affaires d'aujourd'hui, considéré plus changeant et incertain (Eisenhardt & Martin, 2000; Wang & Ahmed, 2007). Pour pallier à ces limites, la perspective des capacités dynamiques est présentée comme une alternative complémentaire à la théorie des ressources jugées plus aptes à supporter la nature évolutive des ressources et des compétences détenues par l'organisation (Eisenhardt & Martin, 2000; Teece et al., 1997; Wang & Ahmed, 2007). Selon plusieurs auteurs, les capacités dynamiques sont des capacités organisationnelles de haut niveau qui chapotent les différentes ressources et compétences de l'organisation (Ambrosini et al., 2009; Pavlou & El Sawy, 2011; Wang & Ahmed, 2007). Elles font référence à des routines spécifiques qui régissent les changements appliqués aux capacités opérationnelles et autres ressources pour les garder aptes à répondre aux besoins de l'environnement (Collis, 1994). Compte tenu de leur action sur les capacités opérationnelles de l'organisation, les capacités dynamiques amènent une meilleure

performance organisationnelle qui se maintient dans le temps (Pavlou & El Sawy, 2006; Teece, 2007; Wang & Ahmed, 2007). Dans le cadre de cet article, nous empruntons ce cadre théorique en l'adaptant au contexte des TI. Ainsi, nous considérons la gouvernance des TI en tant que compétence des capacités dynamiques de l'organisation. Celle-ci se décline à travers une combinaison de mécanismes (structures, processus et mécanismes relationnels) (De Haes & Van Grembergen, 2008) qui régissent les changements appliqués aux différentes ressources et capacités TI de l'organisation. Nous postulons que l'action des mécanismes de gouvernance des TI va agir sur la capacité de gestion des TI de l'organisation en la rendant plus sophistiquée (*IT management sophistication*). Une meilleure sophistication de gestion des TI implique un meilleur alignement stratégique des TI et amène conséquemment une meilleure performance organisationnelle. C'est ainsi que la perspective des capacités dynamiques est utilisée dans ce deuxième article de la thèse afin de décrire et mieux expliquer comment la gouvernance des TI contribue-t-elle la performance organisationnelle.

Approche méthodologique

La méthode de recherche suivie dans le cadre du deuxième article est de nature quantitative. Nous avons plus spécifiquement retenu la méthode de l'enquête quantitative pour mener cette recherche.

La méthode de l'enquête quantitative est parmi les méthodes de recherche les plus utilisées en systèmes d'information (Pinsonneault & Kraemer, 1993a) et en sciences sociales en général (Roberts, 1999). Cette méthode est généralement utilisée dans un but de description ou d'explication (Fink, 2003; Pinsonneault & Kraemer, 1993a; Van der Stede, Young, & Chen, 2005). Dans la présente recherche nous utilisons la méthode de l'enquête dans un but d'explication puisque nous cherchons à tester des relations prédites par la perspective des capacités dynamiques et la littérature en gouvernance des TI. La méthode de l'enquête est appropriée dans ce cas car elle permet d'aborder le phénomène à l'étude dans son contexte naturel et sans manipulation des variables (Kerlinger & Lee, 2000). Selon plusieurs auteurs (Fink, 2003; Fowler, 2014; Hinkin, 1998; Kerlinger & Lee, 2000; Roberts, 1999) la méthode de l'enquête présente plusieurs avantages. En effet :

- Elle est appropriée pour l'étude des échantillons de grandes tailles tout en réduisant l'erreur d'échantillonnage de façon acceptable.
- Les coûts rattachés à la méthode d'enquête sont considérés comme raisonnables et ce en termes de temps et d'argent.
- Elle permet la généralisation des résultats lorsque l'échantillon est probabiliste.
- Elle offre aux répondants la possibilité de bien réfléchir à leurs réponses et de consulter d'autres personnes en cas de besoin.

La méthode d'enquête présente par ailleurs certains inconvénients selon les même auteurs, tel que :

- Le manque de profondeur (*breadth*) et de détails des données.
- L'incertitude quant à la compétence des répondants (sont-ils suffisamment qualifiés pour répondre au questionnaire ?).
- Le risque d'obtenir un faible taux de réponse.
- La difficulté d'établir des liens de causalité entre les variables mesurées.

Pour diminuer au maximum les limites associées à la méthode d'enquêtes, nous avons pris certaines précautions que nous rapportons dans la section « Évaluation de la qualité de la recherche ».

Procédure d'échantillonnage

La collecte de données repose sur une base d'échantillonnage (*sampling frame*) bien définie. Nous avons ainsi identifié dans un premier temps la population à partir de laquelle l'échantillon sera tiré. Dans la présente recherche, la population des répondants est l'ensemble des hauts dirigeants TI œuvrant dans de grandes et moyennes organisations nord-américaines.

À notre connaissance il n'existe pas de listes exhaustives fournissant les noms de ces responsables TI. Cependant, un guide des hauts dirigeants des technologies de l'information au Canada ou *The Directory of Top Computer Executives – Canadian Edition* et son équivalent américain, soit *The Directory of Top Computer Executives – US Edition*

existent et ont été initialement adoptés comme base d'échantillonnage. Ces guides fournissent des informations mises à jour périodiquement et couvrent notamment :

- Les noms, les titres des postes et les numéros de téléphones des hauts dirigeants en TI et /ou des gestionnaires qui supervisent les activités TI (exemple : programmation des applications, le support technique, etc).
- Le nom de la compagnie, le nom de la division ou de la filiale et son adresse postale.
- La taille de la division TI de l'entreprise.
- L'industrie à laquelle appartiennent les différentes compagnies.

Notre intention au départ était de choisir des hauts dirigeants de ces guides et de leur demander de participer à notre étude. Cependant, il nous était difficile de communiquer avec les hauts dirigeants identifiés car il s'agit de personnes très sollicitées. Souvent il fallait laisser un message décrivant l'étude et la demande de collaboration du haut dirigeant dans la boite vocale du secrétariat de direction avec le numéro de téléphone pour nous joindre. On a eu très peu de retour d'appels et plusieurs de ceux qui ont rappelé ont refusé de participer à l'étude en justifiant ce refus par le fait qu'ils soient très occupés ou qu'ils ne peuvent participer à l'étude par mesure de confidentialité. La procédure de collecte de données était donc très au ralenti avec le risque de ne pas obtenir un échantillon de taille suffisante pour réaliser les analyses statistiques. Ces difficultés nous ont amené à modifier la stratégie de collecte de données en contractant les services d'une compagnie spécialisée dans les sondages. Pour bien contrôler la procédure de collecte de données, nous avons fourni à la compagnie de sondage des critères spécifiques lui permettant de bien cerner la base d'échantillonnage que nous visons dans le cadre de cette étude. Nous avons ainsi, spécifié les éléments suivants dans notre contrat de service :

- Les répondants potentiels doivent êtres des hauts dirigeants sélectionnés sur la base de leur position dans l'organisation. Ils doivent ainsi occuper les postes de CIO (*Chief Information Officer*), de directeur TI ou de hauts gestionnaires TI.
- Les répondants potentiels doivent avoir une expérience d'au moins cinq ans dans la gestion et la gouvernance des TI de l'organisation.

- Les répondants potentiels doivent œuvrer dans des organisations de moyennes à grande taille.
- Nous avons par ailleurs demandé à ce que la collecte soit lancée autant au Canada qu'aux États-Unis pour maximiser le nombre de répondants.

Lors du développement du questionnaire nous avons aussi ajouté au début du questionnaire des questions d'identification en relation avec le profil du répondant pour filtrer davantage l'accès aux répondants cibles. Au terme de cette procédure d'échantillonnage et après élimination des questionnaires incomplets, nous avons obtenu un échantillon de 200 répondants ayant complété le questionnaire.

Mode d'administration du questionnaire : Méthode du sondage par internet

Le mode de sondage par internet a été retenu pour l'administration du questionnaire développé pour cette recherche. Il existe différentes déclinaisons du mode de sondage par internet. Parmi elles, nous pouvons citer les sondages effectués par messagerie électronique, les questionnaires téléchargeables et l'usage des outils de communication en ligne, en format texte ou vocal, pour conduire les entrevues électroniques (Couper & Bosnjak, 2010). Ceci étant dit, le mode du sondage par internet le plus répandu de nos jours est celui du questionnaire administré via internet communément appelé l'enquête en ligne (*Internet Survey ou Web Survey*) (Couper & Bosnjak, 2010). Les enquêtes en ligne constituent « des enquêtes qui utilisent les technologies basées sur un navigateur web pour la collecte de données auto-administrées » (Couper & Bosnjak, 2010). Ce mode de collecte de données via le web présente de grands avantages comparativement à un questionnaire envoyé par courrier ou à des entrevues face-à-face par exemple. Nous citons en l'occurrence son faible coût en termes de temps et d'argent (Roberts, 1999). C'est aussi un mode de sondage qui permet l'accès aux données assez rapidement et ce en temps réel tout en garantissant une plus grande précision dans les résultats notamment en l'absence de transcription manuelle des données (Couper & Bosnjak, 2010; Roberts, 1999). Ce type de sondage peut ainsi être effectif en très peu de temps tout en ayant un accès instantané aux résultats. De plus, les données collectées peuvent être transférées directement du collecteur vers d'autres applications et être manipulées sous différents formats (Tableurs, graphiques,

bases de données, etc.) facilitant par le fait même la préparation des données pour l'étape d'analyse.

En outre, certains inconvénients ont été rapportés pour ce type de sondage en ligne. Notons par exemple son orientation web qui exclut les potentiels répondants qui n'ont pas l'habitude d'utiliser internet (Fan & Yan, 2010). Toutefois, selon les caractéristiques de la population cible, l'accessibilité à internet peut ne pas constituer un obstacle en soi (Couper & Bosnjak, 2010). C'est le cas des répondants de la présente recherche (les hauts dirigeants TI), dont l'usage d'internet constitue une monnaie courante dans leur travail.

Instrument de mesure : le questionnaire

L'instrument de mesure utilisé dans cette recherche est le questionnaire. Le questionnaire a été développé en suivant les recommandation de Kerlinger and Lee (2000) et Fink (2003). La première page du questionnaire décrit le but de l'étude, les aspects relatifs à la confidentialité des réponses et les coordonnées des chercheurs (voir le questionnaire dans l'annexe E du chapitre III-Article #2). Dans les instructions présentées à la page subséquente, nous précisons les responsables TI à qui s'adresse le questionnaire et demandons aux participants de fournir des réponses au meilleur de leur connaissance.

La suite du questionnaire est organisée en cinq sections différentes. La section 1 comporte des questions sur les mécanismes de gouvernance des TI en vigueur dans l'organisation (comité de pilotage des TI, engagement de la haute direction dans les TI, système de mesure de performance, etc). La section 2 contient des questions relatives à la mesure de différentes dimensions en rapport avec les capacités de gestion des TI dans l'organisation. Les questions relatives à l'état de l'alignement stratégique des TI de l'organisation sont présentées à la section 3. Les questions relatives à la contribution des TI à la performance organisationnelle sont indiquées dans la section 4. Enfin la section 5 pose aux participants des questions générales relatives à la fonction TI de l'organisation, les caractéristiques de la compagnie (type d'industrie, effectif, chiffre d'affaires, etc.) ainsi que des questions démographiques (poste occupé par le répondant dans l'organisation, son niveau d'étude, son expérience dans la gestion des TI, etc).

Il est à noter que nous avons utilisé des échelles de *Likert* de sept points pour mesurer nos différents construits. L'échelle de *Likert* est l'une des échelles les plus utilisées parce qu'elle demande un temps de réponse raisonnable et permet d'avoir des mesures très fiables (Crano & Brewer, 2002). Tel que recommandé par Doty and Glick (1998), plus d'une définition de l'échelle de mesure a été utilisé afin de réduire l'erreur de mesure. Plus spécifiquement, deux définitions d'échelles ont été utilisées dans le cadre de ce questionnaire. Ainsi, les échelles mesurant le comité de pilotage des TI, le système de communication de l'organisation sur la gouvernance des TI, les capacités de gestion des TI et l'état de l'alignement stratégique des TI de l'organisation sont définies comme étant 1= *strongly disagree* et 7 = *strongly agree*, alors que les échelles mesurant l'engagement de la haute direction dans les TI, le système de mesure de performance d'entreprise, les activités de conformité pour les TI et la contribution des TI à la performance organisationnelle sont définies comme étant 1 = *not at all* et 7 = *to a great extent*. Notons que l'option « N/A » pour non applicable a été rajoutée afin d'assurer l'obtention de réponses valides.

Le questionnaire a été lancé autant au Canada qu'aux États-Unis. Nous avons donc opté pour l'administration du questionnaire en une seule langue, soit l'anglais pour s'assurer de l'uniformité de la procédure de collecte de données dans les deux pays et éviter les problèmes d'équivalence sémantique, conceptuelle et normative que peut engendrer un sondage destiné à des répondants appartenant à des pays différents (Behling & Law, 2000). Notons que les problèmes d'équivalence sémantique existent lorsque le choix des termes et des structures des phrases ne conserve pas le sens de la langue de départ lors de la traduction. De leur côté, les problèmes d'équivalence conceptuelle opèrent lorsqu'un concept opérationnalisé dans la langue de départ n'existe pas sous la même forme dans la culture cible. Finalement, les problèmes d'équivalence normative se posent si le chercheur ne peut pas résoudre les problèmes de différences sociétales, très caractéristique des sondages qui couvrent plus d'un pays à la fois.

Prétest du questionnaire

Le prétest du questionnaire utilisé représente un aspect important de la qualité d'une recherche faite par enquête. Cette procédure permet d'améliorer la validité manifeste et la validité de contenu (Pinsonneault & Kraemer, 1993a). À terme, cette procédure permet

d'évaluer le degré auquel le contenu des items de mesure représente adéquatement le domaine du construit qu'ils sont supposés mesurer (Robson, 1993). Dans la présente recherche, le questionnaire a été soumis à des universitaires (trois professeurs et trois étudiants au doctorat), ensuite il a été soumis à deux directeurs TI. Tout d'abord, nous avons demandé aux universitaires d'évaluer la clarté de la formulation des items du questionnaire et la pertinence de chaque item pour mesurer le construit correspondant. Une première révision a été faite suite aux commentaires reçus. Par la suite, nous avons demandé aux directeurs TI de compléter le questionnaire et de nous indiquer leurs commentaires sur la forme et le contenu du questionnaire ainsi que sur le temps qu'il leur a pris pour le remplir. Des modifications mineures ont alors été apportées.

Analyse des données

L'analyse statistique des données du présent article s'est effectuée en deux étapes. Nous avons tout d'abord procédé à l'évaluation de notre modèle de mesure. Par la suite, nous avons entrepris l'évaluation de notre modèle structurel. La méthode des équations structurelles a été retenue dans ce cadre comme méthode d'analyse statistique des données. Elle convient à l'analyse de notre modèle de recherche notamment parce qu'elle permet de traiter des variables latentes et permet d'estimer aussi bien les relations directes qu'indirectes d'un modèle (Byrne, 2013; Hair, Anderson, Tatham, & Black, 2009; Kline, 2011).

Procédure d'évaluation du modèle de mesure

La procédure d'évaluation du modèle de mesure consiste plus spécifiquement à évaluer la validité des construits du modèle. Cette procédure diffère selon qu'il s'agisse d'un construit réflectif ou formatif (Diamantopoulos & Winklhofer, 2001; Diamantopoulos, 1999; Jarvis, MacKenzie, & Podsakoff, 2003). Un construit réflectif est reflété ou manifesté par ses indicateurs et la causalité va dans ce cas du construit vers les indicateurs. Les indicateurs réflectifs apparaissent ainsi comme variables dépendantes et le construit comme la variable indépendante. Un construit formatif est en revanche formé ou causé par ses indicateurs, ce qui implique une causalité qui va des indicateurs vers le construit (Diamantopoulos, 1999; Diamantopoulos & Winklhofer, 2001; Jarvis, MacKenzie, & Podsakoff, 2003). Dans ce

cas, la variable dépendante est le construit latent et les variables indépendantes sont les indicateurs formatifs.

Le modèle de recherche du présent article est formé exclusivement de construits réflectifs. Nous présentons dans ce qui suit la procédure de validation suivie dans ce cas pour vérifier la fiabilité des construits ainsi que leur validité convergente et discriminante.

Vérification de la fiabilité des construits

Les construits de notre modèle sont issus de la littérature. À l'instar des recherches antérieures, nous avons procédé, à la vérification de leur fiabilité via une analyse factorielle confirmatoire (Bradley et al., 2012; Kim, Shin, Kim, & Lee, 2011) pour déterminer si le nombre de facteurs et les saturations des indicateurs avec les construits sont conformes aux résultats préalablement spécifiés dans la littérature. Plus spécifiquement, la fiabilité de nos construits a été vérifiée moyennant trois indices connus pour informer sur la fiabilité des mesures réflectives:

- Les saturations des indicateurs avec leurs différents construits qui devraient excéder 0,7 (Hulland, 1999).
- Le coefficient de fiabilité composite de chaque construit qui devrait être supérieur à 0,7 (Werts, Linn, & Jöreskog, 1974)
- Le alpha de Cronbach de chaque construit qui devrait être supérieur à 0,7 (Nunnally & Bernstein, 1994)

Les résultats de notre analyse indique que :

- Les saturations des différents indicateurs avec les construits correspondants sont compris entre 0,70 et 0,86 et que ces saturations sont très significatives (toutes les statistiques-t sont significatives à $p<0,001$). Voir le tableau C-1 dans l'annexe C du chapitre III-Article #2 pour plus de détails.
- Les coefficients de fiabilité composite sont compris entre 0,78 et 0,90 (voir tableau 2 du chapitre III-Article #2).
- Les alphas de Cronbach sont compris entre 0,773 et 0,907 (voir le tableau C-1 dans l'annexe C du chapitre III-Article #2).

De plus, les résultats de l'unidimensionnalité des construits a aussi été vérifiée dans le cadre de cette recherche nous permettant d'attester que chaque groupe d'items reflète belle et bien un unique facteur qui lui est sous-jacent (voir le tableau C-1 dans l'annexe C du chapitre III-Article #2 de cette thèse).

Il convient ainsi de conclure que nos mesures présentent un niveau élevé de fiabilité.

Vérification de la validité des construits

La validité convergente de nos construits a aussi été vérifiée dans le cadre de cette recherche. Conformément à la littérature (Fornell & Larcker, 1981), la validité convergente a été estimée par la valeur obtenue du ratio de la variance extraite moyenne (ou AVE). Ce critère d'évaluation rapporte le rapport entre la variance des indicateurs de mesures du construit et la variance totale incluant les erreurs de mesure. L'AVE (*average variance extracted*) doit être supérieure à 0,5. Le tableau 2 du chapitre III-Article #2 de la thèse fournit les valeurs des AVE pour nos construits et indiquent qu'elles sont supérieures à 0,5 puisque elles se situent entre 0,60 et 0,72.

Finalement la validité discriminante de nos construits a aussi été vérifiée. Pour ce faire, nous avons vérifié si la racine carrée de l'AVE de chaque construit est supérieure aux corrélations de ce construit avec les autres construits du modèle. La diagonale du tableau 3 du chapitre III-Article #2 de la thèse fournit les valeurs des racines-carrées de l'AVE de nos construits. Nous pouvons constater que la racine-carrée de chacun des construits est, à quelques exceptions, supérieure aux corrélations de ce construit avec les autres variables latentes de recherche.

Procédure d'évaluation du modèle structurel

L'évaluation de la qualité du modèle structurel nécessite d'examiner les R^2 des variables dépendantes qui permettent d'évaluer la pertinence prédictive du modèle (Hulland, 1999). Les R^2 représentent les coefficients de détermination mesurant la proportion expliquée de la variance d'une variable dépendante par un ensemble de variables indépendantes (Barclay, Higgins, & Thompson, 1995; Chin, 1998). Bollen (1995) considère la valeur R^2 d'une variable explicative suffisamment grande si elle est supérieure à 0,10. Hair, Anderson, Tatham, and Black (1998), indiquent à leur tour qu'un R^2 supérieure ou égale à 0,15 est

considéré comme assurant un pouvoir statistique dans le modèle. La figure 2 du chapitre III-Article #2 de la thèse présente les valeurs des R^2 expliquées par notre modèle. Ces valeurs excèdent le minimum de 0,10 indiqué par Bollen (1995) et surpassent sensiblement le 0,15 mentionné par Hair et al. (1998). Plus précisément, le modèle explique 58% de la variance de la contribution des TI à la performance organisationnelle (*IT contribution to organizational performance*), 91% de la variance de l'alignement stratégique (*Strategic Alignment*) et 74% de la variance de la sophistication de gestion des TI (*IT management sophistication*). Par ailleurs, la figure 2 du chapitre III-Article #2 de la thèse indique les valeurs des coefficients des liens structurels entre les différentes variables et le niveau de leur significativité. Nous pouvons constater que quatre liens sur sept sont significatifs. Parmi ces liens, trois sont significatifs à $p < 0,001$ et un lien significatif à $p < 0,01$.

Nous avons également évalué la qualité de l'ajustement du modèle global aux données. Les différents indices de qualité rapportés dans l'annexe D du chapitre III-Article #2 présentent des valeurs jugées très satisfaisantes en comparaison avec les normes d'interprétation mises en vigueur dans la littérature (Hair et al., 2006; Hu et Bentler, 1999). Ainsi : l'indice de X^2 normalisé (*Normed Chi-square*) est de 1,482 (inférieur au seuil de 3,0), le CFI (*Bentler comparative fit index*) et le TLI (Tucker Lewis Index) sont respectivement de 0,924 et 0,918 (supérieur au seuil de 0,90). Le SRMR (*Standardized root mean square residual*) et le RMSEA (*Steiger-Lind root mean square error of approximation*) sont respectivement de 0,057 et 0,049 (inférieur au seuil de 0,08). De ce fait, nous constatons une bonne adéquation du modèle théorique aux données.

Étant donné les valeurs des R^2 expliquées par notre modèle et les valeurs et significativités statistiques des liens trouvés dans cette recherche ainsi que les valeurs des indices de qualité obtenues, il convient de conclure que notre modèle a un pouvoir explicatif très adéquat (Chin, 1998).

Évaluation de la qualité de la recherche

Roberts (1999) indique qu'il est toujours possible de prendre des précautions pour remédier aux inconvénients de la méthode d'enquête. Cette section présente les précautions que nous avons pris pour améliorer la qualité de la recherche et palier aux insuffisances de la méthode d'enquête en général. Le tableau suivant rapporte les recommandations avancées

dans la littérature (Roberts, 1999) ainsi que les mesures que nous avons considéré dans le cadre de cette recherche pour y répondre.

Précaution à prendre pour remédier aux limites de l'enquête	**Mesures prises dans cette recherche**
Le développement d'un modèle basé sur une théorie et la définition claire des construits de la recherche.	Développement d'un modèle de recherche basé sur la perspective des capacités dynamiques et la littérature en gouvernance et gestion stratégique des TI.
Dans le cas où le questionnaire est la seule méthode utilisée pour la collecte de données, il est possible de suivre certaines procédures pour améliorer la fiabilité et la validité de l'instrument utilisé.	Le questionnaire est la seule méthode de collecte de données utilisée dans cette étude. On a fait appel aux techniques disponibles pour améliorer la fiabilité et la validité de l'instrument utilisé (*face validity* auprès d'experts).
S'assurer de la qualité des données collectées dès l'étape de développement du questionnaire jusqu'à l'étape d'évaluation des variables développées.	Nous avons fait appel à des techniques d'amélioration de la qualité des données lors du développement du questionnaire et d'analyse des données par la suite (exemple : techniques d'identification et de correction des problèmes reliées à la multi-colinéarité entre indicateurs et entre construits, vérification du biais de non réponse).
Recourir aux techniques statistiques pour supporter les relations causales proposées entre les variables du modèle théorique.	Nous utilisons la méthode des équations structurelles et faisons appel aux techniques disponibles pour améliorer le pouvoir statistiques de nos données.

Introduction - Table 1. Évaluation de la qualité de la recherche de l'article #2

Mesure de confidentialité

Des précautions ont été prises pour s'assurer de respecter la confidentialité et l'anonymat des participants à l'étude. En effet, la recherche en question a été approuvée par le comité

d'éthique de la recherche de l'université Laval. À l'issue de cette approbation, nous avons été tenus de présenter à chaque participant à la collecte de données un formulaire de consentement de participation à la recherche stipulant l'entière confidentialité et l'anonymat des participants à l'étude ainsi que leur liberté de se retirer du projet en tout temps.

Contribution Article #2

Le second article de la thèse contribue à l'avancement des connaissances dans le domaine de la gouvernance des TI. Plus spécifiquement, un modèle empirique a été proposé dans le cadre de cet article pour expliquer comment se fait la contribution de la gouvernance des TI à la performance organisationnelle. Sur le plan théorique, la perspective des capacités dynamiques a été appliquée au domaine de la gouvernance des TI pour montrer comment cette dernière pouvait conduire à une meilleure performance grâce à son action en tant que capacité dynamique sur les différentes capacités de gestion des TI de l'organisation. Pour les professionnels l'apport espéré est une plus grande prise de conscience des actions qu'il faut prendre conjointement entre responsables TI et responsables d'affaires pour mieux orienter la prise de décision sur la gouvernance des TI au profit d'une plus grande sophistication de gestion des TI de l'organisation.

Article #3: Examining the influence of External Stakeholders on IT Governance: perceptions of IT executives

Le troisième article de la thèse examine l'importance accordée aux parties prenantes externes dans la gouvernance des TI. Rappelons que la gouvernance des TI constitue une partie intégrante de la gouvernance de l'entreprise. Les recherches antérieures ont essentiellement porté sur l'étude des rôles et responsabilités des acteurs ou groupes intra-organisationnels dans la gouvernance et leur distribution à travers les différents domaines de décision TI de l'entreprise. Bien que n'ayant pas un rôle de décision au niveau de la gouvernance des TI, le *IT Governance Institute* recommande la considération des demandes et revendications des parties prenantes externes au même titre que celles des parties internes dans la poursuite d'une gouvernance des TI qui se veut efficace (IT Governance Institute, 2008). Ainsi, l'objectif de ce troisième article est de contribuer au manque de connaissances sur la place qu'occupent les parties prenantes externes dans la gouvernance des TI. Plus spécifiquement, dans cet article nous cherchons à déterminer le niveau d'importance accordé aux parties prenantes externes dans la gouvernance des TI, en examinant comment celles-ci sont priorisées dans la gouvernance des TI, à travers les différents domaines de décision TI tel que perçu par les hauts responsables TI (*IT executives*) de l'organisation. La question de recherche associée au troisième article de la thèse est la suivante : *Quels groupes de parties prenantes externes considère-t-on comme les plus importants dans un contexte de gouvernance des TI ? Comment sont-ils priorisés dans ce contexte ?*

Base théorique

L'article repose principalement sur deux assises théoriques, soit (1) la théorie des parties prenantes et plus spécifiquement le modèle d'identification et saillance (*salience*) des parties prenantes de Mitchell, Agle, et Wood (1997), et (2) la classification des domaines de décision TI de Grover, Henry, and Thatcher (2007).

La théorie des parties prenantes a été abordée par les recherches antérieures selon trois perspectives distinctes : descriptive, instrumentale et normative (Donaldson & Preston, 1995). Le présent article, s'insère dans la perspective descriptive de la théorie. La perspective *descriptive* de la théorie des parties prenantes s'intéresse à rapporter les

relations entre l'organisation et son environnement. Selon cette perspective, l'organisation est perçue comme une constellation d'intérêts coopératifs et compétitifs ayant une valeur intrinsèque (Donaldson & Preston, 1995). Cette perspective couvre des modèles théoriques tel que celui de Mitchell et al. (1997) qui ont pour objectif d'analyser les relations de l'organisation avec ses parties prenantes afin de mieux les gérer. Ainsi, le troisième article de la thèse se base sur les principes du modèle de Mitchell et al. (1997), présenté ci-dessous, pour examiner l'importance accordée aux parties prenantes externes dans la gouvernance des TI.

Le modèle d'identification et de saillance des parties prenantes (Mitchell et al., 1997)

Le modèle de Mitchell et al. (1997) considère au départ que la stratégie qu'une entreprise utilise pour interagir avec une partie prenante est déterminée par son importance comparée à une autre partie prenante. Le modèle proposé constitue ainsi un outil d'analyse et d'aide à la décision pour les gestionnaires leur permettant d'identifier et de classer les parties prenantes selon leur niveau de saillance (importance) perçue par l'organisation. Pour ce faire, Mitchell et al. (1997) propose une caractérisation des parties prenantes sur la base de trois critères de saillance : le pouvoir, la légitimité et l'urgence. Selon Mitchell et al. (1997), une partie prenante est dite avoir du pouvoir (exprimé ou potentielle) si elle a la faculté d'imposer sa volonté sur l'organisation. Une partie prenante est dite légitime s'il y a une perception généralisée que ses demandes ou revendications sont convenables et appropriées en fonction des systèmes de normes, de valeurs et croyances en place. Finalement, une partie prenante est caractérisée par l'urgence si ses demandes ou revendications sont ressenties comme importantes et nécessitent une attention immédiate de la part du gestionnaire au sein de l'organisation. Ces trois attributs ne sont pas objectifs mais constituent plutôt des constructions subjectives de la réalité et dépendent de la perception du gestionnaire (Mitchell et al., 1997). Selon le modèle de Mitchell et al. (1997) le nombre d'attributs octroyés à une partie prenante détermine son niveau de saillance (i.e. importante) tel que perçu par le gestionnaire. Le modèle de Mitchell et al. (1997) est utilisé dans le cadre de cet article de façon adaptée pour déterminer le niveau d'importance accordé aux parties prenantes externes dans la gouvernance des TI. Il a été plus spécifiquement combiné à la classification des domaines de décision TI de Grover et al.

(2007) présentée ci-dessous pour examiner comment se fait la priorisation des parties prenantes externes dans la gouvernance des TI à travers les différents domaines de décision TI de l'organisation.

Classification des domaines de décision TI (Grover et al., 2007)

D'une façon générale, la gouvernance des TI couvre les différents domaines de décision TI de l'organisation (IT Governance Institute, 2003). Ainsi, nous ne pouvons examiner l'importance accordée aux parties prenantes externes dans la gouvernance des TI sans tenir compte de comment elles sont priorisés à travers les différents domaines de décision TI de l'organisation. Il existe différentes classification des domaines de décisions TI dans la littérature (Grover et al., 2007; Sambamurthy & Zmud, 1999; Weill & Ross, 2005). Nous avons retenu celle de Grover et al. (2007) car elle est plus complète que les autres classifications présentées dans la littérature en incluant le domaine de la sous-traitance des TI en plus des autres principaux domaines de décision TI auxquels font face les organisations de façon générale. Ainsi, en se basant sur la classification de Grover et al. (2007), nous avons plus spécifiquement examiné dans le présent article comment se fait la priorisation des parties prenantes externes à travers les domaines de décision TI suivants :

- La vision stratégique des TI : déterminer le rôle stratégique des TI dans l'organisation.
- L'architecture TI : décider de comment les capacités techniques doivent être organisées pour les besoins d'affaires.
- Les investissements TI : décider du plan des investissements TI (budget, types d'investissements et priorité des investissements).
- Infrastructure TI : décider de comment les services TI doivent être livrés et partagés.
- Le développement des applications : décider de comment gérer les projets de développement des applications et leur implantation.
- La sous-traitance des TI : décider de la politique de sous-traitance et de sa gestion.

Plus spécifiquement, nous avons analysé le niveau d'importance accordé aux parties prenantes externes dans la gouvernance des TI en examinant comment elles sont priorisées à travers les différents domaines de décision TI cités plus haut.

Approche méthodologique

Les méthodes de recherches sont à la base de la production de connaissances quel que soit le domaine étudié (Pinsonneault & Kraemer, 1993a). L'approche méthodologique suivie dans le cadre du troisième article est de nature qualitative. Elle suit plus particulièrement un paradigme interprétativiste. Le paradigme épistémologique interprétativiste soutient que la « réalité » est une construction sociale par les acteurs humains dont les comportements et les perceptions constituent un élément central dans la question à l'étude. Ainsi, « *l'objectif d'une recherche interprétative consiste à appréhender un phénomène dans la perspective des individus participant à sa création, en fonction de leurs langages, représentations, motivations et intentions propres.*» (Andreani & Conchon, 2005, p.43). Or, c'est à travers les perceptions de responsables TI (*IT executives*) que nous cherchons dans cet article à examiner l'importance accordée aux parties prenantes externes dans la gouvernance des TI. Plus spécifiquement, nous avons entrepris une enquête qualitative auprès de responsables TI pour comprendre comment se fait la priorisation des parties prenantes externes dans la gouvernance des TI à travers les différents domaines de décision TI de l'organisation.

Méthode de recherche

La méthode de l'enquête qualitative a été plus spécifiquement retenue pour répondre à la question de recherche du troisième article. Les enquêtes qualitatives consistent à interroger un petit nombre de personnes, qui s'expriment longuement, par entrevue (Van der Stede et al., 2005). Selon Fink (2003, p.61), «*qualitative surveys collect information on the meanings that people attach to their experiences and on the ways they express themselves*». La méthode de l'enquête qualitative repose le plus souvent sur des entrevues et autres méthodes qualitatives de collecte de données (Fink, 2003). Il est généralement reconnu que l'approche par enquête soit rattachée à des études quantitatives qui visent principalement à fournir, sur une population donnée, des distributions numériques des variables à l'étude dans l'objectif est d'expliquer un phénomène donnée (Pinsonneault & Kraemer, 1993b). Si les enquêtes quantitatives fournissent des ordres de grandeur, des indications de tendances,

permettent d'établir des comparaisons et d'observer des relations entre les variables, elles permettent difficilement de traduire la diversité des pratiques en fonction des contextes et d'appréhender directement la multiplicité des logiques, mécanismes, processus à l'œuvre derrière les différents usages (Roberts, 1999). L'enquête qualitative vise ainsi à étudier la diversité (et non la distribution) d'un sujet dans une population donnée en mettant en évidence les variations (principales dimensions et valeurs) dans cette population (Jansen, 2010). C'est ainsi qu'il est possible d'utiliser des données quantitatives dans des enquêtes qualitatives en tant que métriques de catégorisation pour les besoins de l'analyse qui reste foncièrement qualitative. Jansen (2010) précise « *a study on body length is a qualitative survey if it searches for the categories (values) of this dimension that are present in a given population and if it uses these metric data as categorical data in further analysis* ». Comme nous le verrons dans la section « collecte de données », c'est ainsi que nous avons eu recours à des pondérations du niveau de saillance des parties prenantes en plus de l'analyse du discours des différents répondants pour mieux analyser l'importance accordée aux parties prenantes externes dans la gouvernance des TI.

Collecte de données

L'enquête qualitative utilisée dans le cadre de cette recherche repose principalement sur une collecte de données par entrevues. L'entrevue est l'une des méthodes de collecte de données les plus utilisées et considérée parmi les plus efficaces en recherche qualitative (Thiétart, 2007). Elle se caractérise par l'engagement du participant dans une conversation directe avec le chercheur (Thiétart, 2007). Une entrevue peut être conduite selon différents modes : face à face (individuelle ou en groupe), téléphonique ou électronique (Kerlinger & Lee , 2000, p.666). Elle se décline également sous différents formats : entrevues structurées, non-structurées ou semi-structurée (aussi appelées semi-directive) (Fowler, 2014). L'enquête qualitative entreprise dans le cadre de cette recherche repose sur la méthode des entrevues semi-structurées ou semi-dirigées. Les entrevues semi-dirigées ont été ici favorisées compte tenu de leur capacité à collecter des informations factuelles, des précisions contextuelles mais aussi des opinions personnelles (Fink, 2003, p.61). C'est à travers des entrevues semi-dirigées que les opinions et expériences des responsables TI ont été recueillis et constituent par conséquent les sources de réponse à la question de recherche du troisième article. La durée des entrevues a été entre 45 et 90 minutes. Elles se sont

déroulées en grande partie par téléphone en raison de l'emplacement géographique des répondants ou à leur demande compte tenu de leur emploi du temps très chargé. L'ensemble des entrevues ont été enregistrées puis retranscrites à la main produisant ainsi des verbatims. Les personnes rencontrées lors des entrevues ont été sélectionnées selon un échantillonnage raisonné, ou *purposeful sampling* (Patton, 2002). Le premier critère pour effectuer l'échantillonnage est l'expérience des répondants. Nous avons ainsi souhaité rencontrer des responsables TI qui avaient une grande expérience dans la gouvernance des TI de par leur implication directe dans la prise de décision TI de l'organisation ainsi que leur participation active sur divers comités de gouvernance des TI (i.e. différents niveaux de comités de pilotage TI). Par ailleurs, nous voulions recruter des répondants provenant de zones géographiques différentes (i.e. Québec, Ontario et l'Alberta) et de secteurs d'activités diverses (i.e. activités de production, services, banques, assurances, organisations gouvernementales, firmes conseils) afin d'assurer une plus large variation dans la population interviewée. Dans le processus de collecte de données, une pré-notification a été réalisée à travers des appels téléphoniques et l'envoi de courrier électronique aux participants potentiels dans le but de susciter leur intérêt (Frohlich, 2002). L'objectif principal de cette étape est d'informer les individus contactés de l'enquête qualitative à réaliser prochainement et de son importance. Le but était aussi de leur expliquer l'objectif de la recherche et de solliciter leur collaboration.

Pour les besoins des entrevues, un ensemble de questions ont été développées pour recueillir la perception des personnes interviewées quant à la place qu'occupent les parties prenantes externes dans la gouvernance des TI (voir Annexe A du chapitre IV-Article #3). Lors des entrevues, des réponses quantitatives (correspondants aux valeurs fournies par les répondants aux trois critères de saillance attribuées aux différentes parties prenantes) en plus du discours qualitatif ont constitué la base de l'analyse de données entreprise dans le cadre de cet article. Le recours à des données quantitatives dans cette enquête à connotation qualitative constitue un point de référence pour catégoriser les parties prenantes externes selon leur niveau de saillance. De plus, ces valeurs de référence ont été utilisées lors de l'analyse pour mieux appréhender le discours qualitatif des répondants quant à la façon dont les parties prenantes externes sont priorisées dans la gouvernance des TI à travers les différents domaines de décision TI.

Analyse

Les données retranscrites ont été par la suite codées et analysées en vue d'en sortir le sens et les idées saillantes. L'analyse de données suivie pour une enquête qualitative peut suivre une approche de recherche inductive ou déductive ou une combinaison des deux (Fink, 2003; Jansen, 2010). "In *the open/inductive survey, relevant objects/topics, dimensions (aspects of objects, variables) and categories (values and dimensions) are identified through interpretation of raw data (e.g. interview transcripts). In the pre-structured survey, some main topics, dimensions and categories are defined beforehand and the identification of these matters in the research units is guided by a structured protocol for questioning or observation*" (Jansen, 2010, p.4). Ultimement, l'approche déductive permet de valider les hypothèses et théorie auxquelles l'enquête se réfère de façon à priori. L'approche inductive quant à elle peut faire émerger de nouvelles idées et connaissances en marge des éléments d'analyse préalablement préconçus dans la grille d'analyse (Andreani & Conchon, 2005; Fink, 2003).

Pour s'imprégner au maximum du verbatim et approfondir notre connaissance de la question à l'étude, nous nous sommes doté dans notre cas d'une double approche d'analyse de données : déductive puis inductive. Nous avons procédé dans un premier temps à un codage fermé. C'est ainsi que les discours ont été découpés en unités d'analyse, puis regroupés en catégories et sous-catégories suivant une grille d'analyse déterminée préalablement à partir de notre cadre théorique. La grille d'analyse fait ainsi référence à des critères incluant les domaines de décision TI, les attributs de saillance comme le pouvoir, la légitimité et l'urgence des revendications des parties prenantes externes, les intérêts des parties prenantes pour les TI de l'organisation (voir Annexe B du chapitre IV-Article #3). En plus, de l'analyse du discours qualitatif, les valeurs quantitatives relatives aux critères de saillance (pouvoir, légitimité et urgence) fournis par les répondants à chaque partie prenante nous a permis d'estimer le niveau de saillance (*saliency*) attribué à chaque partie prenante. Ces valeurs quantitatives ont été utilisées en guise de valeurs de référence en combinaison avec l'analyse du discours pour mieux approfondir l'analyse déductive des données recueillies. Par la suite, un codage ouvert a été reconduit selon une procédure ouverte et inductive pour faire émerger le cas échéant de nouvelles catégories à partir des données recueillies. C'est ainsi que la catégorie « type d'influence des parties prenantes » a

émergé des données, donnant lieu à l'énoncé d'une nouvelle proposition de recherche et enrichissant par le fait même notre cadre théorique de départ. L'ensemble des analyses effectuées ont fait appel aux jugements du chercheur principal (premier auteur de l'article) et des superviseurs de la thèse. Les résultats de la recherche ont par ailleurs été discutés dans le cadre de conférences avec comités de lecture.

Évaluation de la qualité de la recherche

la validité et la fiabilité constituent les deux critères d'évaluation de la qualité et de la rigueur de la recherche en gestion (Thiétart, 2007, p.264). Contrairement à l'approche quantitative où la validité et la fiabilité se vérifient à travers des tests statistiques, dans une démarche qualitative la validité et la fiabilité dépendent plutôt des précautions prises par le chercheur durant la recherche (Thiétart, 2007). Dans le cadre de cette recherche la qualité de la recherche est testée par trois principaux critères : la validité interne, la validité externe et la fiabilité de la recherche.

La validité interne ou *crédibilité* (Thiétart, 2007) revient à s'assurer de la pertinence et de la cohérence interne des résultats de la recherche. Ce type de validité est notamment affecté par le design global de la recherche qualitative. Ainsi, la validité interne tend à augmenter quand le chercheur s'applique à décrire et expliciter la stratégie d'analyse adoptée et les outils utilisés pour le faire (i.e. usage de matrices et tableaux, valeurs quantitatives de catégorisation du niveau de saillance). Ceci permet d'augmenter la transparence du cheminement conduisant aux résultats. La validité interne dépend également de l'atteinte du niveau de saturation des données qui se trouve augmenté par l'utilisation de la technique de triangulation lors de la collecte de données (verbatims, documents envoyés par les répondants, présence d'une assistante de recherche dans certaines entrevues). Finalement, il est recommandé de soumettre les résultats de la recherche aux personnes ayant participées à l'étude et autres experts dans le domaine. Les résultats de la recherche ont ainsi été communiqués aux superviseurs, aux répondants de l'étude et discuté par des experts externes dans le cadre de conférences.

La validité externe ou *transférabilité* revient à estimer dans quelle mesure les résultats de la recherche sont généralisables à la population à laquelle appartient l'échantillon à l'étude (Thiétart, 2007). Elle dépend selon (Thiétart, 2007) de deux facteurs : la sélection d'un

échantillon représentatif et la description de la méthode de la recherche et de ses conditions. Tel que précisé précédemment l'échantillon sélectionné dans le cadre de cette recherche a été choisi selon une approche d'échantillonnage raisonné, ou *purposeful sampling* (Patton, 2002). Ceci nous a permis d'avoir accès à un échantillon bien représentatif de la population cible.

La fiabilité de la recherche conduit à l'obtention des mêmes résultats par des chercheurs différents en répétant les différentes opérations initialement adoptées dans la recherche de base (Thiétart, 2007). La fiabilité repose largement sur la capacité du chercheur à rapporter de manière exhaustive la démarche méthodologique suivie dans le cadre de la recherche afin d'augmenter sa fiabilité (verbatims, archivage du protocole de l'entrevue et autres documents utilisés, profils des participants, etc.).

Le tableau suivant présente les mesures prises dans le cadre de cette recherche pour améliorer sa validité et sa fiabilité.

Test	**Mesures prises**
Validité interne	Protocole d'entrevue Enregistrement des entrevues et leur transcription (verbatims) Base de données des résultats et des données recueillies Discussion des résultats avec le superviseur et chercheurs dans le domaine lors de conférences. Le recours à une assistante de recherche lors de la collecte de données. Confrontation des résultats avec la revue de la littérature.
Validité externe	Description détaillée de la méthodologie de la recherche. Comparaison par rapport à la littérature existante.
Fiabilité	Le maintien d'une base de données avec les données collectées (verbatims, documents et notes).

Introduction - Table 2. Évaluation de la qualité de la recherche de l'article #3

Mesure de confidentialité

Avant de procéder aux entrevues, une demande d'approbation de la recherche par le comité d'éthique de l'université Laval a été effectuée. La demande comprenait le message de recrutement, un formulaire de consentement à être rempli par chaque participant, et le protocole d'entrevue. Par mesure de non divulgation des renseignements personnels, les personnes interrogées devaient être désignées par leur fonction et non leur nom. De même, les données démographiques sur les organisations dans lesquelles ils opéraient devaient être citées sans mentionner les noms des organisations correspondantes.

Contribution Article #3

L'apport de cet article porte sur l'avancement des connaissances quant à la l'importance accordée aux parties prenantes externes dans la gouvernance des TI de l'organisation. Les résultats montrent que la priorisation des demandes des parties prenantes externes dans le contexte de gouvernance des TI varie selon les domaines de décision des TI. De même, l'influence que peuvent avoir les parties prenantes externes dans ce cadre peut être directe ou indirecte selon leurs rôles dans les activités TI ou la relation qu'ils entretiennent avec l'organisation dans son ensemble. Le recours à la théorie des parties prenantes comme fondement théorique constitue à notre connaissance une première dans le domaine de la gouvernance des TI. Cette recherche se veut ainsi exploratoire d'un domaine de recherche jusque-là peu étudié.

Lien entre les articles

Maximiser la valeur des TI pour l'organisation à travers une gouvernance efficace des TI est devenue une préoccupation majeure mais aussi un défi du monde des affaires d'aujourd'hui (Buchwald et al., 2014; IT Governance Institute, 2008). Mieux comprendre le rôle de la gouvernance des TI dans la réalisation de la valeur des TI pour l'organisation (*IT business value*) constitue ainsi la toile de fond qui lie les trois articles de cette thèse. Plus précisément, l'article #1, intitulé *The impact of IT governance on organisational performance: a conceptual framework proposition*, se penche sur l'étude de la nature de la relation qui lie la gouvernance des TI à la performance organisationnelle en présentant un cadre conceptuel, fondé sur des bases théoriques, pour interpréter ce lien. L'article #2,

intitulé *Impact of IT governance on organisational performance: proposing an explanatory model*, se base sur la conceptualisation proposée dans l'article #1 pour développer un modèle empirique de l'impact de la gouvernance des TI sur la contribution des TI à la performance organisationnelle. Finalement, l'article #3, intitulé *Examining the influence of External stakeholders on IT Governance: perceptions of IT executives*, apporte un éclairage complémentaire à la question en examinant l'importance accordée aux parties prenantes externes (*external stakeholders*) dans la gouvernance des TI. L'article #3 part du principe qu'une gouvernance des TI efficace et qui se veut déterminante dans la réalisation de la valeur des TI pour l'organisation doit prendre en considération toute partie prenante qui peut influencer la prise de décision TI de l'organisation, incluant les parties externes.

Les trois prochains chapitres présenteront l'intégralité des trois articles de la thèse.

CHAPITRE II – ARTICLE 1

THE IMPACT OF IT GOVERNANCE ON ORGANIZATIONAL PERFORMANCE: A CONCEPTUAL FRAMEWORK PROPOSITION

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ABSTRACT

Recent years have seen substantial growth in research on information technology (IT) governance. Despite this proliferation, the influence of IT governance on organizational performance has gone relatively unexplored. To address this gap, this paper proposes a conceptual model intended to provide a better understanding of the relationship between IT governance and organizational performance. On the basis of a review of extant research on IT governance and guided by the dynamic capabilities perspective, the proposed model suggests that the effectiveness of IT governance mechanisms (structures, processes and relational mechanisms), contribute to the development of a dynamic IT governance competence which in turn has an impact on the development of IT management capabilities and their evolution (i.e. IT management sophistication). Moreover, IT governance is more likely to lead to better organizational performance when IT management capabilities are developed in line with business strategy.

Keywords: IT Governance, IT management sophistication, strategic alignment, organizational performance, dynamic capability perspective.

INTRODUCTION

Information technologies (IT) are revolutionizing the business world. In addition to providing support for daily operations, they have also become an integral part of business processes within and across organizational boundaries, therefore affecting the quality of service offered to customers, and altering the nature of different organizational relationships.

According to Gartner (2014a), IT investments represent more than 6% of revenue of many organizations and still rising. Gartner (2014a) further expects that global IT spending will surpass $ 3.8 trillion in 2014, which accounts for a 3.1% increase from 2013. This growth will quicken in 2015, rising 8.1% in US dollars according to Forrester analysis by Andrew Bartels (2014). Unfortunately, many enterprises still fail to demonstrate concrete, measurable business value for the investment done in IT (IT Governance Institute, 2008). Luftman and Zadeh (2011) state that business leaders and IT executives are developing major concerns related to the alignment of IT with business needs and the impact of IT on productivity and costs reduction. Therefore, business management has to pay special attention to IT and avoid failures through the implementation of effective IT governance (Juiz & Toomey, 2015).

The effect of IT governance on corporate performance is indisputable (Csaszar & Clemons, 2006). For instance, Weill and Ross (2005) found that successful companies in terms of IT governance tend to experience a 20% increase in profits, higher returns on equity and growth in market capitalization than other companies pursuing similar strategies. Although, it has been observed that superior IT governance performance may be correlated to higher financial performance, few studies have empirically addressed the impact of IT governance on organizational performance (Boritz & Lim 2007; Bradley et al., 2012; Jewer & McKay, 2012; Lazic, Groth, Schillinger, & Heinzl, 2011; Liang, 2011), and much less on how IT governance contribute to improving organizational performance (Lazic et al., 2011). Given this lack of research on this topic, a question arises: How is IT governance related to

organizational performance? In order to answer this research question, in this paper, we look in detail at the literature and develop a comprehensive conceptual model based on the dynamic capabilities perspective that proposes a path analysis of IT governance and organizational performance relationship. This model suggests that the relationship between IT governance and organizational performance is more complex than a simple direct effect and posits IT management sophistication and strategic alignment as mediators of this relationship.

The remainder of this article is organized in a series of interrelated sections. In the next section, we review salient literature on IT governance and related concepts (i.e. IT management sophistication, coordination theory). To complement this relevant literature, we then present the principles of dynamic capabilities perspective, used in this paper to guide the development of a comprehensive conceptual model on IT governance impact on organizational performance and demonstrate five propositions associated with it. Finally, we discuss the contributions and limitations of the model, and propose avenues of future research in this domain.

LITERATURE REVIEW–IT GOVERNANCE

IT governance is often presented as an integral part of corporate governance (Weill & Ross, 2004). It consists of the leadership, organizational structures, and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives (IT Governance Institute, 2003). More specifically, IT governance occurs through the specification of decision rights and accountabilities framework designed to encourage desirable IT-related behavior within an organization (Weill & Ross, 2004).

A review of past research shows that IT governance research has mainly focused on four main streams (see Appendix A for a summary of the literature): the design of IT decision-making structures, IT governance implementation, IT governance outcomes, and IT governance performance.

Stream 1. Design of IT decision-making structures

The first stream of IT governance research deals with the decision-making structures adopted in the design of IT organizations. An extensive body of past research was dedicated to this area (for a detailed review on this topic, see Brown and Grant (2005)). More specifically, research in this stream focused on the description of decision-making structures adopted by individual IT organizations through the specification of the distribution of roles and responsibilities for decision-making on various organizational IT activities. Early research dealt with three primary IT governance modes, namely centralized, decentralized, and federal/hybrid governance modes (Ein-Dor & Segev, 1982; Olson & Chervany, 1980; Sambamurthy & Zmud, 1999). In these IT organizational structures, decision-making authority is placed respectively within a central IT unit, business units or a combination of both. Thereafter, Weill and Ross (2004) expanded the traditional IT governance forms and propose that there are six governance classifications available to IT organizations based on the ideal of political archetypes. These archetypes include: business monarchy (IT decisions are made by CxOs), IT monarchy (Corporate IT professionals make the IT decision), feudal system (IT decision by autonomous business units), federal system (Hybrid decision making), IT duopoly system (IT executives and one business group), and anarchy (each small group makes decisions). Moreover, in past research we notice a consensus among researchers on the fact that a universal best IT governance structure does not exist. Rather the best IT governance solution for a given organization is contingent on a variety of factors (Brown & Magill, 1994; Sambamurthy & Zmud, 1999; Tavakolian, 1989), including corporate governance, business strategy, and organizational size among others.

Stream 2. IT Governance implementation

The second stream of IT governance research focusing on the deployment of IT governance in organizations can be classified as either normative or descriptive. The normative studies (e.g., Dahlberg & Kivijarvi, 2006; De Souza Bermejo & al., 2014; Fink, 2008; Goosen & Rudman, 2013; IT Governance Institute, 2005; Subsermsri & al., 2015) offer frameworks, methods, or guidelines to foster the effective implementation of IT governance in organizations. This research also addresses adherence to internationally recognized standards and best practices (such as COBIT, ITIL, ISO17799: 2000, AS8015) intended to

facilitate effective organizational deployment of IT governance. For example, as a structured approach to IT governance, the COBIT method (Control Objectives for Information and related Technology) provides managers, auditors, and IT users with performance indicators to assist the supervision of IT implementation within the organization (IT Governance Institute, 2005). Descriptive studies (e.g., Bhattacharjya, 2007; De Haes, Gemke, Thorp, & Van Grembergen, 2011; De Haes & Van Grembergen, 2009; Grüttner, 2010; Weill & Ross, 2004; Vaia & Carmel, 2013; Van Saull, & De Haes, 2003; Williams & Karahanna, 2013) illustrate the ways in which organizations implement a framework for IT governance. These studies have shown that IT governance is often deployed using a combination of various practices, namely organizational structures, processes, and relational mechanisms (Peterson, 2004; Van Grembergen, De Haes, & Guldentops, 2004; Weill & Ross, 2004). IT governance structures include the establishment of organizational units and the definition of formal positions and roles responsible for IT decisions making processes that enable horizontal contact between the business and IT management functions within the organization (De Haes & Van Grembergen, 2008; Peterson, 2004). These structures (e.g., IT steering committee, IT strategy committee, IT expertise at the board level) include decision makers from various levels in the organization: corporate executives, IT management personnel, and business managers (Peterson, 2004; Weill & Ross, 2004). IT governance processes refer to the formalization and institutionalization of IT strategic decision-making and IT monitoring procedures (e.g., IT strategic planning, system performance measurement [IT Balanced Scorecard, COBIT, ITIL]) (De Haes and Van Grembergen, 2008; Peterson, 2004) to ensure that daily activities are consistent with existing long-term policies and provide feedback necessary to guide decisions (Peterson, 2004; Van Grembergen et al., 2004; Weill & Ross, 2004). Finally, relational mechanisms refer to the active participation of and collaborative relationship among corporate executives, IT management personnel, and business management personnel in relation to IT governance (Peterson, 2004; De Haes & Van Grembergen, 2008). Relational mechanisms (e.g., co-rotation positions, co-location and training) are often essential for promoting alignment between IT strategy and business needs (Bhattacharjya, 2007; Callahan & Keyes, 2004; Van Grembergen et al, 2004).

Stream.3 IT Governance outcomes

The third stream of research on IT governance explores the influence of IT governance mechanisms on the alignment between IT and business strategy. In addition, this stream of research also addresses the influence of IT governance on organizational performance.

IT Governance and IT/Business alignment

The first objective of IT governance is to ensure closer alignment between the organization's IT and business strategies (IT Governance Institute, 2003). In recent years, researchers have studied this assumed relationship by exploring how the implementation of IT governance can contribute to a better strategic alignment of IT with business needs (Beimborn, 2009; De Haes & Van Grembergen, 2009; Kuruzovich et al, 2012; Preston & Karahanna, 2009; Schlosser & Wagner, 2011). Studies on this issue have specially examined the influence of IT governance mechanisms (structures, processes, and relational mechanisms) on the strategic alignment of IT in the organization. For instance, De Haes and Van Grembergen (2009) found that organizations that use a combination of more mature IT governance mechanisms were likely to achieve greater strategic alignment. Subsequent studies have quantitatively examined the correlation between the use of one or more IT governance mechanisms and the achievement of IT strategic alignment in organizations. For example, research by Beimborn et al. (2009) illustrated that the support of senior management as a structural governance mechanism yields greater IT strategic alignment. Similarly, Preston and Karahanna (2009) explored the influence of the degree to which the Chief Information Officer (CIO) participates in the top management team (TMT) and the hierarchical status of the CIO (i.e., whether the CIO reports directly to the Chief Executive Officer (CEO)) on strategic alignment. The specific relationship between the CIO and the Chief Financial Officer (CFO) was also considered as a critical pairing, which impacts both individual effectiveness and strategic alignment (Schobel & Denford, 2012). As denoted by the authors, these mechanisms promote interaction, knowledge exchange, and knowledge integration between the CIO and the TMT, thereby contributing to the development of a shared understanding about the role of IT within the organization (which represent the social dimension of IT strategic alignment) (Preston & Karahanna, 2009). In another study, Kuruzovich and his colleagues (2012) examined the role of the board of directors in driving IT alignment. They found that (a) the direct involvement of the board of

directors in managing IT, (b) CIO communications with the board, (c) strategic consideration of IT investments, and (d) the amount and usefulness of the information provided to the board of directors regarding IT promote IT alignment in organizations (Kuruzovich et al., 2012). Moreover, High levels of board-level IT governance increase organizational performance (Turel & Bart, 2014). Other researchers have investigated the use of IT steering committee as a structural IT governance mechanism (De Haes & Van Grembergen, 2009; IT Governance Institute, 2003; Van Grembergen et al., 2004). In this context, IT steering committees are found to significantly contribute to the strategic alignment of IT with business strategies (Schlosser & Wagner, 2011).

IT Governance and organizational performance

In recent years, researchers have examined the influence of IT governance on organizational performance (Boritz & Lim, 2007; Bradley et al., 2012; Jewer & McKay, 2012; Lazic et al, 2011; Liang et al., 2011). Boritz and Lim (2007), for example, showed that organizational use of high-level IT governance mechanisms (e.g., IT strategy committee, CIO position) generate improved financial performance. Similarly, Jewer and McKay (2012) reported that board involvement in IT governance positively moderates the relationship between IT governance implementation and organizational performance. Liang et al. (2011) stated that IT governance performance is related to better strategic alignment of IT, which in turn improves organizational performance. Related to this, a recent study by Bradley et al. (2012) showed that the quality of IT governance mechanisms positively contributes to organizational performance among public and private hospitals by improving relationships with customers, market responsiveness, and operational efficiency.

Taken together, researchers have shown that there exists a positive relationship between the quality of IT governance and organizational performance. Although they have done much to reveal the positive correlation between IT governance and observed improvement in organizational performance, they have failed to determine *how* IT governance improve organizational performance. In past IT governance literature, only Lazic and his co-authors (2011) have sought to explain how organizational performance is positively affected by IT governance. They explained that IT governance is positively

related to business performance through common use of IT resources, IT processes, and business processes throughout the organization's various business units.

Stream 4. IT Governance performance

Finally, the fourth stream of research which focus on the performance of IT governance, has been approached in two ways: through the evaluation of overall IT governance performance (Barbosa & al., 2014; Bradley & Pratt, 2011; Coleman, 2011; Lahdelma & Dahlberg, 2007, Lee et al, 2009; Simonsson, Johnson & Ekstedt, 2010; Tugas, 2010, Weill & Ross, 2004) and the assessment of individual IT governance mechanisms adopted by the organization (Ali & Green, 2005, 2007, 2012; Bradley et al., 2012; De Haes & Van Grembergen, 2008; Ferguson, Green, Vaswani, & Wu, 2013; Heindrickson & Carlos, 2014).

Evaluation of the overall performance of IT Governance

Weill and Ross (2004) were the first to propose an evaluation of the overall performance level of IT governance in organizations. They proposed an assessment tool that is based on a comparative analysis of the organization's IT governance outcomes relative to the established goals. Other researchers have subsequently expanded the measurement of IT governance performance by gauging its maturity level using COBIT performance indicators (Cobo & al., 2014; Coleman, 2011; Simonsson et al., 2010; Tugas, 2010; Lee, Lee, Park, and Jeong, 2008). While other researchers (e.g. Dahlberg & Kivijarvi, 2006; Dahlberg & Lahdelma, 2007) have based their measurement on IT governance objectives (i.e. strategic alignment, value creation, risk management, management of IT resources and IT management performance) as an evaluation criteria to assess IT governance maturity.

Assessment of IT Governance mechanisms

De Haes and Van Grembergen (2008) have examined the performance of IT governance mechanisms. Specifically, they have evaluated the performance of these mechanisms according to industry experts by assessing their maturity, ease of implementation, and perceived effectiveness. Other researchers (Bradley & Pratt, 2011; Bradley et al., 2012) have assessed IT governance by measuring the degree to which an organization uses IT governance mechanisms. Finally, another contingent of researchers (Ali & Green, 2005, 2007, 2012; Ferguson et al., 2013; Heindrickson & Carlos, 2014) measured the extent to

which IT governance in organizations is effective. To perform this evaluation, these scholars have empirically examined the influence of individual IT governance mechanisms on the overall effectiveness of IT governance.

Despite the various foci of the research described above, researchers appear to agree that IT governance occurs through an organizational structure that specifies roles and responsibilities for IT decision-making. The overall structure operates through mechanisms or IT governance practices. These take the form of structures (committees, liaison roles), processes (methodologies and best practices for IT strategic management, IT monitoring and control), and relational mechanisms (communication and collaboration among different IT and business stakeholders). The organization can leverage a wide range of mechanisms to implement IT governance (De Haes & Van Grembergen, 2009, Peterson, 2005). Through a combination of mechanisms, IT governance ensures the planning, organization, and control of IT-related activities (Prasad, Heales, & Green, 2010) in order to achieve better strategic alignment of IT capabilities with business needs (De Haes & Van Grembergen, 2009) and attains superior performance of the organization as whole (Prasad et al., 2010).

Following this literature review, we note that there has been very little research that investigates the relationship between IT governance and organizational performance, even less has attempted to explain *how* IT governance influences organizational performance. In addition, previous research has demonstrated that to maximize IT value, the mere implementation of IT governance is not sufficient. It is important that the implemented practices are mature enough to generate the expected value for the organization (De Haes, Van Grembergen, 2009). Indeed, an organization must constantly question the effectiveness of the implemented IT governance mechanisms and revise them in an active IT governance design process geared towards promoting the enterprise's objectives and performance goals (Weill & Ross, 2004, p.222). As stated by Weill and Ross (2004), it is important not only to actively design the overall IT governance, but also to review individual mechanisms regularly as a perquisite to mature IT management capabilities and maximize their contributions to the business. Therefore, there seems to be a close relationship between IT governance performance and the effectiveness of IT management capabilities of the organization. For instance, Karimi, Bhattacherjee, Gupta, and Somers (2000) have

demonstrated that the effective use of IT steering committees (a structural IT governance mechanism) has a positive impact on IT management sophistication. As such, the level of IT management sophistication could be an indicator of the performance of IT governance achieved in the organizations as well as an enabler for strategic alignment and organizational performance. The following section, will present the concept of IT management sophistication in more details.

IT MANAGEMENT SOPHISTICATION

Past research on IT management sophistication (also called IT maturity) suggests the use of IT management practices as benchmark variables for measuring the progression of organizations toward IT management sophistication (Gupta, Karimi & Somers, 1997; Huang, 2009; Karimi et al., 2000; Karimi, Gupta, & Somers, 1996; Karimi, Somers, & Gupta, 2001; KIM, Shin, Kim, & Lee, 2011). In particular, previous studies suggested the use of practices including IT planning, IT control, IT investment decision-making (Kim et al. 2011), IT organization, IT coordination (Kim, Shin, Kim, & Lee, 2011), and IT integration (Karimi et al., 1996). It is argued that higher level of IT management sophistication would imply a significant formalization of the different IT management practices (Karimi et al., 2000). These practices will now be defined in more detail.

IT planning

IT planning is based on protocols and formal and informal procedures (Kim et al., 2011). As the IT function becomes more mature within an organization, the nature of the IT planning will change from a simple computing plan to a long-term IT strategic plan (Karimi et al., 1996). The first objective of IT planning at the maturity stage is to align IT plans with the organization's business plans (Brown & Magill, 1994; Chan, Huff, Barclay, & Copeland, 1997; Das, Zahra & Warkentin, 1991; Karimi et al., 2000).

IT investment decision-making

IT investment decision-making is assumed to support and strengthen an organization's strategic position (Kim et al., 2011). Decisions on IT investment have significant implications for the organization's operations management, with respect to productivity, quality of management decisions, cost management, and the performance of business-

related processes (Kim et al., 2011). Furthermore, IT investment decisions can have a significant impact on a company's revenue, and organizational performance as a whole (Ryan & Harrison, 2000; Ryan et al., 2002). Therefore, the process of investment decision-making needs to be structured through well-established formal procedures and mechanisms such as resource selecting mechanisms (Makadok, 2001).

IT control

Organizations with a high degree of IT control (through the support of various formal management control mechanisms and procedures such as COBIT, Val IT, IT Balanced scorecard, etc.) are better equipped to manage their IT budget, prioritize IT functions, control IT resource planning, and define the roles and responsibilities of IT staff (Karimi et al., 2001). In contrast, businesses with few IT control processes are less efficient due to a weak governance structure (Kim et al., 2011).

IT coordination

IT coordination allows for the synchronization of interactions among IT management units (Kim et al., 2011). This coordination is made possible through the use of various mechanisms, including reporting systems, direct contact, the initiation of task forces, and cross-functional teams (DeSanctis & Jackson, 1994, Peterson, 2004). The effective use of such mechanisms strengthens the exchange between parties (i.e. IT staff and business personnel), which will ultimately improve IT services management (Fulk & Boyd, 1991).

IT organization

Companies with evolving IT organization have the ability to involve key people in IT activities. For instance, this means the participation of business personnel in IT project development cycle to foster smooth integration of IT with business processes (Rivard & Talbot, 2001, p. 121). As well as offering users' ideas special attention in planning and IT implementation processes (Karim et al., 2000). In doing so, new forms of IT organizations will be considered where IT responsibilities is shared between IT people and business management in response to organizational context and business needs (Brown, 1997).

IT integration

As the IT function matures, IT integration across the enterprise becomes critical (Karimi et al., 1996). IT integration allows the use of shared IT resources and standards across the entire organization. This will not be effective unless IT strategies, policies, and objectives have permeated throughout the organization yielding, as a result, to better alignment of the IT organization with the enterprise goals (IT Governance-Institute, 2003).

Conclusion

In conclusion, IT management sophistication characterizes organizations' evolution of their IT managerial practices toward greater formalization in line with business needs and context. This in turn would suggest that IT function in an organization with higher levels of IT management sophistication would have evolved from a simple data-processing orientation into a strategic IT orientation (Gupta et al., 1997). We argue that it is through the deployment of effective IT governance mechanisms that the organization's IT management capabilities will evolve toward greater sophistication. This in turn will increase the IT function contribution to organization's goals and objectives (IT Governance Institute, 2003) by enabling strategic alignment and consequently promoting improvement in organizational performance. Past research on IT governance focused greatly on coordination theory to describe IT governance deployment strategies in organizations. Although, the use of coordination theory has contributed a lot to the growing body of research on IT governance, we think, as explained later, that it lacks to highlight the adaptive capacity of IT governance to organizational environment. As an attempt to fill this gap, we have focused on the dynamic capabilities perspective as a way of theorizing about IT governance and its contribution to organizational performance.

THEORETICAL BACKGROUND: FROM COORDINATION THEORY TO DYNAMIC CAPABILITIES PERSPECTIVE

For decades, coordination theory has received attention from researchers in different disciplines. This theory has been used to analyze the design of complex processes. Thus, coordination theory has largely contributed to manage dependencies in several settings by providing a wide range of coordination mechanisms, including the standardization of

processes, rules, and procedures (Thompson, 1967; Lawrence & Lorsch, 1967), mutual adjustment, direct contacts, meetings (Thompson, 1967; Lawrence & Lorsch, 1967), integrators and liaison roles (Lawrence & Lorsch, 1967, Galbraith, 1973), project teams, committees (Lawrence & Lorsch, 1967), objectives setting, standardization of results (Galbraith, 1973; Mintzberg, 1979), the matrix structure (Galbraith, 1973), and the standardization of skills through training (Mintzberg, 1979).

Coordination theory is based on two principal claims: 1) dependencies and the mechanisms to manage them can be found in a variety of organizational settings (i.e. generality of coordination mechanisms) ; and 2) there are often several coordination mechanisms that can be used to manage a dependency (Crowston & Osborn, 1998).

Past research on IT governance as depicted in section two, are heavily influenced by coordination theory principles. In fact, these principles inspired the analysis of IT governance deployment strategies in organizations (e.g. Agarwal & Sambamurthy, 2002; Brown, 1997, 1999; Brown & Ross, 2003; Peterson, 2000; Peterson, 2004; Weill & Ross, 2004; De Haes & Van Grembergen, 2008, 2009). Past research has largely sought to describe and explain how organizations employ formal and informal coordination mechanisms to allow IT governance stakeholders to coordinate their efforts and better manage interdependencies in the organization's IT activities. Thus, it was argued that IT governance can be deployed using a mixture of structures, processes and relational mechanisms (Peterson, 2004; Weill & Ross, 2004; De Haes & Van Grembergen, 2008, 2009). Moreover, Past research has come up with specific IT governance mechanisms as a general baseline in the deployment of IT governance in organizations (Weill & Ross, 2004; De Haes & Van Grembergen, 2008). Together, the coordination theory approach has significantly contributed to IT governance research by setting a theoretical framework that guides the analysis of IT governance deployment in organizations. However, this theoretical framework lacks the consideration of the dynamic nature of the organizational environment, as it promotes the *generality* of coordination mechanisms under different organizational context. We believe that the dynamic capabilities perspective can be considered as an alternative theoretical framework to analyse IT governance dynamics and its contribution to organizational performance.

Applying the dynamic capabilities perspective to IT governance context

The notion of dynamic capabilities is typically presented as complementary theory to the resource-based view of the firm (Priem & Butler, 2001; Wang & Ahmed, 2007). It strengthens arguments related to the RBV and overcome its static perspective by addressing the changing nature of resources and expertise possessed by organizations in light of a highly dynamic business environment (Wang & Ahmed, 2007). As definded by Teece et al. (1997) "*dynamic capabilities refer to the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments*". Organizations create their dynamic capabilities and develop them over time through a combination of processes and coping mechanisms, absorption, and innovation (Wang & Ahmed, 2007). These capabilities extend and modify the resource and capabilities base of an organization (Ambrosini, Bowman, & Collier, 2009). According to Wang & Ahmed (2007), dynamic capabilities are embedded in processes and are firm-specific. Moreover, they are perceived as conductive to long-term firm performance (Pavlou & El Sawy, 2006; Teece, 2007; Wang & Ahmed, 2007). They also present certain commonalities across organizations that are identifiable and measurable (Eisenhardt & Martin, 2000). Therefore, recent research focused on clarifying the foundations of dynamic capabilities, usually within a conceptual discussion of firm resources and capabilities in a hierarchical order (Ambrosini, Bowman, & Collier, 2009; Pavlou & El Sawy, 2011; Teece, 2007; Wang & Ahmed, 2007). For instance, Teece (2007) advances that dynamic capabilities can be disaggregated into sensing, seizing and transformational activities. Wang and Ahmed (2007) recognize that adaptive capability, absorptive capability and innovative capability are the most important component factors of dynamic capabilities. Pavlou and El Sawy (2011) suggest sensing the environment, learning, coordinating and integrating capabilities as micro-foundations of dynamic capabilities. Finally, building on prior research, Ambrosini et al. (2009) extent the concept of dynamic capabilities and suggest that there are three levels of dynamic capabilities, namely incremental, renewing and regenerative dynamic capabilities. Throughout the different conceptualizations depicted in the literature, dynamic capabilities actually consist of "identifiable and specific routines that often have been the subject of extensive empirical research in their own right" (Eisenhardt & Martin,

2000, p. 1107). In sum, dynamic capabilities govern the rate of change of operational capabilities to keep them valuable in response to environmental change (Collis, 1994).

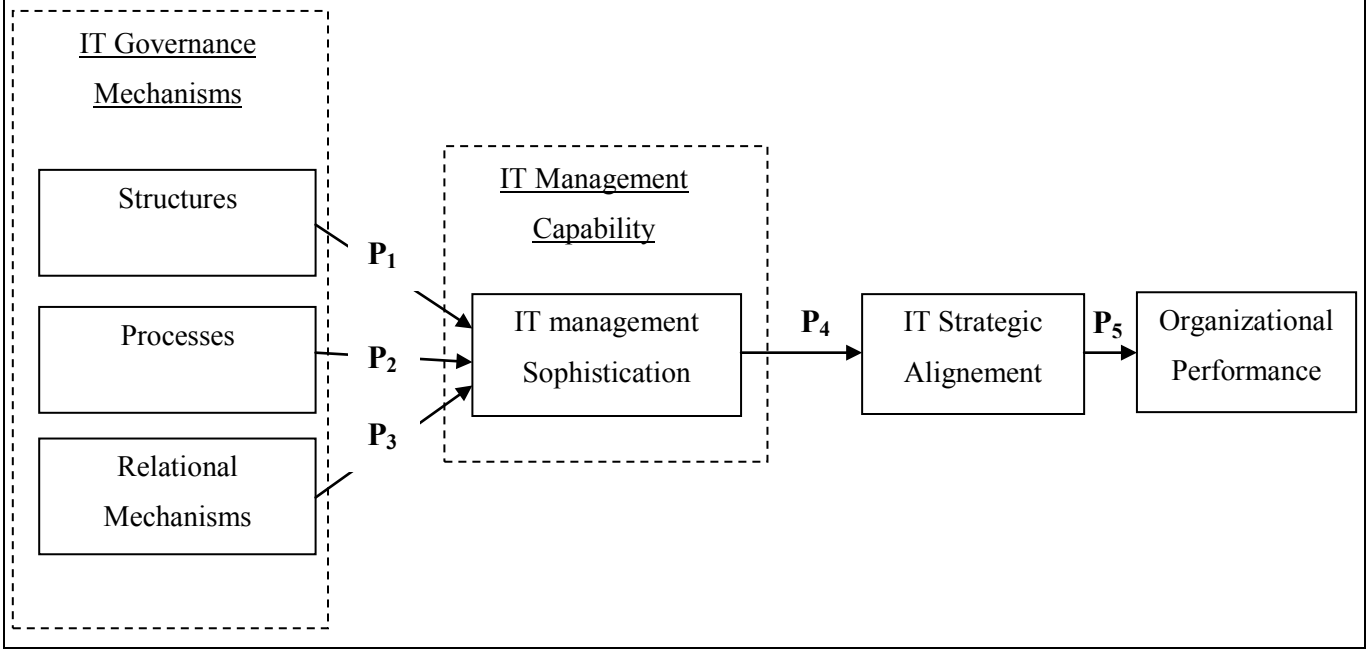
In information systems (IS) research, the dynamic capabilities perspective was essentially used to explain the changing nature of organizational capabilities during the process of IT strategic planning (Duhan, 2007) and to analyze the dynamics of the IT strategic alignment process (Baker et al, 2011; Chen et al, 2008; Pelletier, 2012) as well as understanding organizational designs in IT-related capabilities development (Prasad, Green, & Heales, 2013).

Using similar argumentation as for "dynamic capabilities", we believe that a rationale could be built up for IT governance and its impact on organizational performance. In the following section, we propose an integrated framework for understanding IT governance impact on organizational performance in light of the dynamic capabilities perspective. Thus, we reckon that IT governance is a dynamic capability competence that impacts the organization's IT management capabilities development and evolution (i.e. IT management sophistication) as directed by the business strategy, resulting on better strategic alignment leading ultimately to better organizational performance (when IT management capabilities are developed in line with the organization's strategic choices).

IT GOVERNANCE IMPACT ON ORGANIZATIONAL PERFORMANCE: CONCEPTUAL MODEL AND PROPOSITIONS

As said earlier, the conceptual model presented in Figure 1 uses dynamic capabilities perspective to provide a more comprehensive understanding of the influence of IT governance on organizational performance.

Article 1 - Figure 1 Conceptual Model



Through this model (see Figure 1), we suggest that the relationship between IT governance and organizational performance is more complex than a simple and direct effect. Indeed, we propose a conceptual model incorporating IT management sophistication and strategic alignment as mediators of the IT governance and organizational performance relationship. The rationale behind the proposed model is illustrated through the following research propositions.

IT governance mechanisms and IT management sophistication

As mentioned in past research, the essence of dynamic capabilities is an organization's constant pursuit of the reconfiguration, integration and re-creation of its resources, capabilities and most importantly upgrade and reconstruct its core capabilities in response to the environmental change to attain and sustain competitive advantage (Wang & Ahmed, 2007).

Drawing on dynamic capabilities perspective, we reckon that IT governance is a dynamic capability competence that focus on the renewal, reconfiguration and re-creation of IT resources, capabilities and core IT capabilities (e.g. IT management capabilities) to address the (internal and external) environmental change. In IT governance context, environmental

change can be caused by a combination of several factors including regulatory change, technological innovation or the changing competitive nature of the industry and the organization need of growing into new business models that it generates (IT Governance Institute, 2008).

As a result, the organization needs to upgrade and recreate its core IT capabilities including its IT management capabilities to be able to respond to internal and external environmental change. According to Wang and Ahmed (2007), capability development and evolution is an outcome of dynamic capabilities. Thus, dynamic capabilities govern the rate of change of capabilities (Collis, 1994). Drawing on this, we posit that the development and evolution of IT management capabilities (i.e. IT management sophistication) is an outcome of IT governance (as a dynamic capability competence). As such, IT governance has an impact on the development of IT management capabilities and their evolution.

The literature on dynamic capabilities has identified a range of processes and routines that can be recognized as providing certain micro-foundations for dynamic capabilities. For instance, Eisenhardt and Martin (2000) identify cross-functional R&D teams, new product development routines, quality control routines, and technology transfer and/or knowledge transfer routines, and certain performance measurement systems as important elements (micro-foundations) of dynamic capabilities. To make a parallel with these findings, IT governance can be deployed using a mixture of IT governance practices, namely structures, processes and relational mechanisms (De Haes & Van Grembergen, 2008; Peterson, 2004; Weill & Ross, 2004). As such, we consider IT governance mechanisms as micro-foundations of IT governance dynamic competence that underpin an organization's ability to reconfigure, renew and recreate its IT resources, capabilities and core IT capabilities and most important influence IT management capabilities development and evolution (i.e. IT management sophistication).

IT Governance structural mechanisms and IT management sophistication

Structural mechanisms, such as IT steering committees, IT strategy committees, and involvement of senior management in IT affect IT management sophistication by providing the organizational structures to support the development and evolution of the different IT management capabilities (e.g. IT planning, IT investment decision-making, IT

coordination, etc.) in line with strategic goals and objectives (IT Governance Institute, 2003; Karimi, Bhattacherjee, Gupta, & Somers, 2000; Peterson, 2004; Prasad, Heales, & Green, 2010). For instance, Karimi et al. (2000) showed that companies using IT steering committees tend to have higher degrees of IT management sophistication than those that do not. Moreover, the IT Governance Institute has established the importance of such committees in developing, implementing, and conducting effective IT governance (IT Governance Institute, 2003). Indeed, many organizations carry out their IT governance deployment trough such committees in order to drive IT strategy development and implementation. The establishment of well-balanced committees with the representation of key members that includes business as well as IT representatives enhances the effectiveness of such committees (De Haes & Van Grembergen, 2008). Indeed, Successful IT governance structures requires communication amongst all parties based on constructive relationship to foster understanding organization's IT-related competencies and forge ways to increment them (Prasad et al., 2013). As such, we argue that structural mechanisms as part of IT governance dynamic competence contribute to the organization's ability to upgrade and recreate its IT management capabilities as important IT core capabilities. Based on these arguments, we offer the following proposition:

P1: *Effective IT governance structures have a positive impact on IT management sophistication.*

IT Governance processes and IT management sophistication

Effective IT governance is also deployed through the institutionalization and formalization of strategic IT decision-making and IT monitoring procedures (De Haes & Van Grembergen, 2009). For example, strategic information systems planning is one of the most effective IT governance processes used by companies to define and update the IT strategy (De Haes & Van Grembergen, 2009). This mechanism, if effectively used, contributes to the formulation of an IT strategy that meets business needs (Peterson, 2004). This would suggest that strategic information systems planning mechanism as part of IT governance dynamic competence will influence IT management sophistication through organization's IT planning capability development and evolution in line with strategic goals and objectives. IT performance measurement system (e.g., IT balanced scorecard) is another

example of governance process that is widely recognized as useful process in terms of management control of IT success (Van Grembergen, 2000; Van Grembergen, Saull, & De Haes, 2003) . In addition, this system uses to be one of the most effective processes of IT governance that aids organizations to achieve IT and business alignment (IT Governance Institute, 2003). For instance, IT balanced scorecards are defined to help to understand how the contribution of IT towards the business will be realized (Van Grembergen et al., 2003) by focusing on tangible as well as intangible elements (i.e. financial, customer, internal process and learning perspectives) (IT Governance Institute, 2003). This would suggest contributor role of performance measurement systems in fostering sensing and learning capabilities of IT governance dynamic competence. Past research also noticed that the effective use of performance measurement systems such as an IT balanced scorecard contribute in supporting IT management practices monitoring and adjustment in line with business needs (Chang & King, 2003; Decoene & Bruggeman, 2006; Hu & Huang, 2006). It helps also to foster consensus among key stakeholders about IT's strategic goals, to communicate about IT's performance, risk and capabilities as well as IT's effectiveness and added value (IT Governance Institute, 2003, 2008) thus promoting coordinating capability as a dynamic component factor of IT governance. Therefore, we propose that:

P2: E*ffective IT governance processes have a positive impact on IT management sophistication.*

IT Governance relational mechanisms and IT management sophistication

The deployment of an effective IT governance framework can be facilitated by multiple relational mechanisms (e.g., co-rotation positions, co-location, training, Knowledge management on IT governance). We argue that relational mechanisms can be recognized as providing certain micro-foundations for IT governance as a dynamic capability competence. These mechanisms play an important role in the success of IT governance within the organization (Peterson, 2004) and paramount for attaining and sustaining alignment between IT and business needs even when the appropriate structures and processes are in place (De Haes & Van Grembergen, 2008). These mechanisms facilitate communication, collaboration, and the active participation of stakeholders, and develop a shared understanding of the IT function's role within the organization (i.e. social dimension

of strategic alignment) (Van Grembergen et al., 2004; Preston & Karahanna, 2009). At the same time, strategic alignment is seen to be positively associated with IT management sophistication (Karim et al., 2000). Given this, we posit that:

P3: *effective IT governance relational mechanisms have a positive impact on IT management sophistication.*

IT management sophistication and IT strategic alignment

Following past research on dynamic capabilities perspective (Pavlou & El Sawy, 2006; Wang & Ahmed, 2007), we posit, as detailed in previous section, IT management capabilities development and evolution (i.e. IT management sophistication) as an outcome of IT governance. The path of building IT management capabilities is not universal across organizations and therefore IT management sophistication is different across organizations (Gupta, Karimi, & Somers, 1997; Karimi et al., 2000; Karimi, Somers, & Gupta, 2001; Kim, Shin, Kim, & Lee, 2011). In fact, the level of IT management sophistication relates to the role of IT in the organization and its capacity to respond to business strategy (Gupta et al., 1997). A high degree of IT management sophistication suggests that the IT function has evolved from the basic role of supporting data-processing operations to a strategic partner role for the organization (Gupta et al., 1997; Karimi et al., 2000). Hence, IT management capabilities development and evolution (i.e. IT management sophistication) as an outcome of IT governance is often steered by organization strategy. In line with this idea, Gupta et al. (1997) found that organization's competitive strategy has an impact on IT management sophistication. In addition, Karimi et al. (2000) posit effective IT management is often reflected in a conscious coordination of the relationship between business strategy and IT resources. As such, we propose that:

P4: *IT management sophistication is positively associated with IT strategic alignment.*

IT strategic alignment and organizational performance

The ultimate objective of IT governance is to accomplish better IT strategic alignment and maximize the value of IT for the organization (De Haes & Van Grembergen, 2008; IT-Governance Institute, 2003). Several studies have demonstrated strategic alignment to improve organizational performance (Chan, Sabherwal, & Thatcher, 2006; Khaiata &

Zualkernan, 2009; Tallon, Kraemer, & Gurbaxani, 2000). For example, Chan et al. (1997) found that companies that possess a high level of strategic alignment perform better than others do with respect to market growth, innovation and company reputation aspects. Moreover, companies that achieve strategic alignment of IT tend to attain greater competitive advantage, visibility, efficiency, and profitability (Luftman & Brier, 1999). Other studies have shown that superior IT strategic alignment is positively related to organizational performance by promoting organizational learning and growth (Liang, Chiu, Wu, & Straub, 2011). Karimi et al. (2001) also found that firms that strategically use their information technology tend to have more sophisticated IT management capabilities, resulting in greater competitive advantage, improved customer service, and better organizational performance. Given these research findings, we offer the following proposition:

P5: *IT strategic alignment is positively associated with organizational performance.*

It is worth noting that our conceptual model as presented in figure 1 carries out three principal ideas:

(1) This model suggests that the effectiveness of IT governance mechanisms contribute to the development of a dynamic IT governance competence. IT governance as a dynamic capability competence has an impact on the development of IT management capabilities and their evolution (i.e. IT management sophistication).
(2) At the same time, the path of building IT management capabilities is not universal across organizations, and therefore the outcome of IT management capability development is different across organizations. Organizations tend to develop IT management capabilities as directed by business strategy. Hence, this model proposes that IT management capability development is an outcome of IT governance dynamic competence, as steered by business strategy leading consequently to a certain level of strategic alignment.
(3) Moreover, IT governance as a dynamic capability competence is more likely to lead to better organizational performance when IT management capabilities are developed in line with business strategy.

CONTRIBUTIONS, LIMITATIONS, AND FUTURE RESEARCH

In this article, we proposed a conceptual model to provide a more comprehensive understanding of the influence of IT governance on organizational performance. In this section, we review the contributions, limitations, and future research directions born from this research.

Theoretical contribution

As depicted from the literature review, to date, there has been very little research on the link between IT governance and organizational performance. Thus, this paper contributes to filling this research gap by providing a comprehensive conceptual model that proposes an explanation of IT governance organizational performance relationship. In addition, to our knowledge this research constitutes a first attempt in the use of dynamic capabilities perspective as a theoretical basis to explain IT governance impact on organizational performance. Through five research propositions, we explain that IT governance leads to organizational performance but the relationship is an indirect one mediated by IT management sophistication and strategic alignment.

Managerial contribution

This research in addition to its theoretical contributions also has some managerial implications as well. Inspired from our theoretical model, we argue that business and IT managers must cooperate to implement IT governance mechanisms that will enable effective IT management. Moreover, our conceptual model strengthen the idea of IT governance as continuous process that should be monitored and evaluated on a regular basis so that its IT-related business value expectations could be realized and sustained over time.

Limits and future research

The conceptual model propositions require further validation in future research, as we cannot say with certainty that each proposition is valid beyond the findings from past research that provide their collective basis. To address this limitation, it would be useful for future research to identify specific IT governance mechanisms that can be recognized as

providing certain micro- foundations for IT governance dynamic competence. Moreover to validate the propositions that comprise the conceptual model, a longitudinal qualitative case-study research could be performed to estimate the effect of IT governance as a dynamic capability competence on organizational performance over time. Semi-structured interviews with IT directors, business managers, and auditors of information systems can provide significant insight regarding the nature of the relationships we have proposed. In addition, we suggest the development of a multidimensional construct of IT governance dynamic competence that could be validated through a quantitative research study and further examined in a nomological network to provide a better understanding of under what circumstances (e.g. contextual factors) IT governance impacts on organizational performance.

CONCLUSION

In this article, we proposed a conceptual model to explain the influence of IT governance on organizational performance using dynamic capabilities perspective as a theoretical background. We argue that the relationship between IT governance and organizational performance is more complex than a simple direct effect. Thus, we posit IT management sophistication and strategic alignment as mediators of this relationship. The proposed conceptual model suggests that effective IT governance mechanisms contribute to the development of a dynamic IT governance competence, which in turn has an impact on the development of IT management capabilities and their evolution (i.e. IT management sophistication). Moreover, IT governance is more likely to lead to better organizational performance when IT management capabilities are developed in line with business strategy suggesting the valuable effect of strategic alignment on organizational performance.

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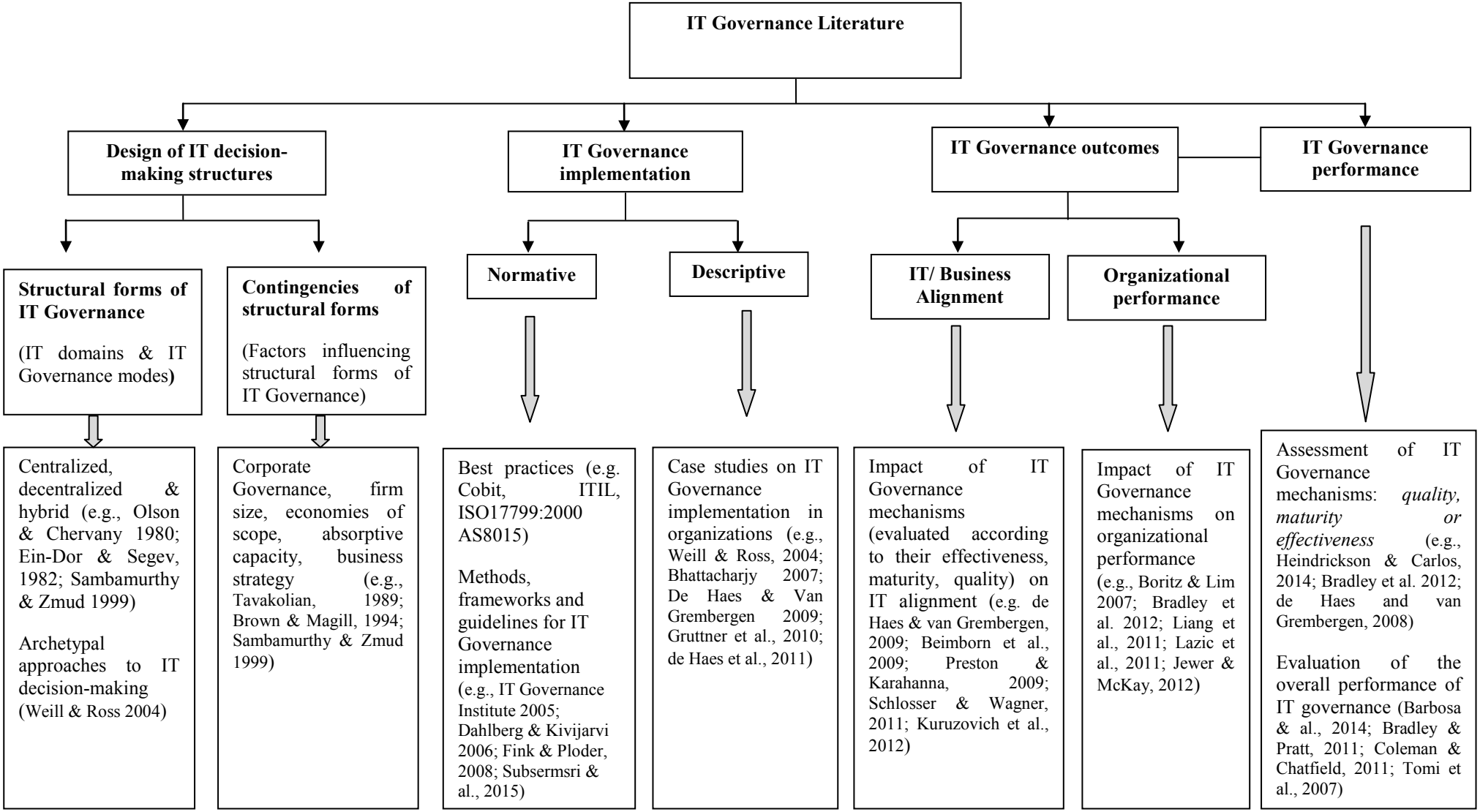
APPENDIX - SYNTHESIS OF IT GOVERNANCE LITERATURE



CHAPITRE III-ARTICLE 2

IMPACT OF IT GOVERNANCE ON ORGANIZATIONAL PERFORMANCE: PROPOSING AN EXPLANATORY MODEL

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ABSTRACT

Past research on IT governance found a positive relationship between IT governance and overall organizational performance. However, theoretical models explaining the impact of IT governance on organizational performance are scarce. This study proposes a theoretical model and draws upon the dynamic capabilities perspective to propose and empirically examine the impact of IT governance on IT contribution to organizational performance. Our research model states that IT governance as a dynamic capability competence positively affects through its mechanisms the overall level of IT management capability (i.e. IT management sophistication). IT management sophistication facilitates strategic alignment, which improves IT contribution to organizational performance. We empirically test our hypotheses based on survey data from 200 North American organizational IT executives. The results show that specific IT governance mechanisms (i.e. performance measurement systems and senior management involvement) positively influence IT management sophistication. Moreover, our analysis confirms that IT management sophistication is the principal predictor of organizational strategic alignment. We also found a significant and positive relationship between strategic alignment and the contribution of IT to organizational performance

Keywords: IT Governance, IT management sophistication, strategic alignment, IT contribution to organizational performance, dynamic capability perspective, survey method.

INTRODUCTION

Information technology (IT) is currently at the forefront of almost all organizational components and functions. The pervasive use of technology has created a critical dependency on IT, leading to a substantial increase in IT spending and investment. According to Gartner (2014a), the size of an average enterprise's IT investment is currently greater than 6 percent of its annual revenues and continues to increase. These company investments result in IT spending that exceeds 50 percent of the annual total capital investment of many enterprises (Weill & Ross, 2004). This critical dependency on IT requires that enterprises focus on IT governance. IT governance is composed of leadership and organizational structures and processes to ensure that the organization's IT[1] sustains and extends the organizational strategies and objectives (IT Governance Institute, 2003).

According to De Haes and Van Grembergen (2009b), efficient IT governance improves business/IT alignment. In addition, Weill and Ross (2004) argue that effective IT governance can account for a 20 percent increase in profits. More recently, the IT Governance Institute affirmed that the most commonly experienced outcomes of IT governance practices by firms are improvements in return on IT investments, IT delivery of business objectives, and business competitiveness (IT Governance Institute, 2011).

Despite these facts, academic research on IT governance and its impact on organizational performance remains in early stages (Boritz & Lim, 2007; Jewer & McKay, 2012; Lazic, Groth, Schillinger, & Heinzl, 2011; Liang, Chiu, Wu, & Straub, 2011). Previous research found a positive relationship between IT governance and organizational performance. However, how does IT governance contribute to organizational performance? This research fills the research gap by developing a model that examines the relationship between IT governance and organizational performance. The research model uses survey methodology to test the IT governance impact on IT contribution to organizational performance.

The proposed model is based on the dynamic capabilities perspective. As stated by Pavlou and El Sawy (2011), dynamic capabilities govern change in operational capabilities by reconfiguring them to ensure their relevancy in a changing environment. Based on the

[1] In this definition, IT is understood to encompass the infrastructure as well as the capabilities and organization that establish and support it.

dynamic capabilities view, we see IT governance as a dynamic capability competence that focuses on reconfiguring existing IT management capabilities and resources. Past research has emphasized that IT governance can be deployed using a combination of various structures, processes, and relational mechanisms (De Haes & Van Grembergen, 2008; Peterson, 2005a; Weill & Ross, 2004) to control the formulation and implementation of the IT strategy and produce desirable IT usage behaviors. These behaviors ensure that IT initiatives sustain and extend the organization's strategy and objectives (IT Governance Institute, 2003). Thus, our research model states that cogent IT governance has a positive effect on IT management capabilities, which leads to strategic alignment and superior IT contribution to organizational performance.

To test the research model, the study proceeds as follows. The following section reviews existing literature on IT governance and discusses IT governance through the lens of the dynamic capabilities perspective. We then characterize and propose relevant hypotheses as part of our research model. Next, we describe the field survey research method used for this study. Following the presentation of the results of our hypotheses testing, we discuss the theoretical and practical implications and limitations of our study. We conclude the paper by presenting opportunities and directions for future research.

THEORETICAL DEVELOPMENT

IT governance

Since the last decade, IT governance has been the focus of increasing attention from both practitioners and researchers. IT governance is widely recognized as an integral part of enterprise governance with a focus on information and IT asset strategic management and control (IT Governance Institute, 2008). Initially driven by compliance initiatives, such as Sarbanes Oxley in the US and Basel II in Europe, IT governance is currently associated with the acquisition of IT business value (Bradley et al., 2012; Weill & Ross, 2004; Xue, Liang, & Boulton, 2008). According to the IT Governance Institute (2008) "Getting better business value from IT requires the right leadership; well-defined processes with clear roles, responsibilities and accountabilities; appropriate structures; and supporting metrics,

information, and tools. In short, an effective approach to enterprise governance of IT is required" (p. [10]).

Past research stated that IT governance can be deployed using a mixture of various structures, processes, and relational mechanisms (De Haes & Van Grembergen, 2008; Peterson, 2004; Peterson, O'Callaghan & Ramon, 2000; Weill & Ross, 2004). According to Peterson (2004a), IT governance structures consist of structural or formal devices and mechanisms, such as steering committees, which enable horizontal contact between business and IT management (decision making) functions. However, IT governance processes refer to the "formalization and institutionalization of strategic IT decision making or IT monitoring procedures" (Peterson, 2004a, p. [15]) (e.g., the IT balanced scorecard). Finally, the relational mechanisms concern "the active participation of, and collaborative relationship among, corporate executives, IT management, and business management" (Peterson, 2004a, pp. [15]) (e.g., training).

The majority of IT governance research has focused on the structural aspects by examining the locus of control and governance structures, the contingency analysis, and a combination of both. The main contribution of this IT governance stream of research is the examination and empirical justification of various IT governance framework propositions addressing IT governance forms and IT governance contingency influences (Brown, 1997; Brown, 1999; Brown & Magill, 1998; Sambamurthy & Zmud, 1999; Weill & Ross, 2005). Brown and Grant (2005) provide a thorough analysis of the existing literature stream. The second IT governance stream of research tackles an equally important aspect of IT governance – process mechanisms. IT governance is perceived as an overarching initiative encompassing different aspects of process mechanisms (Bradley et al., 2012). Such process mechanisms include but are not limited to enterprise management methodologies, metric, and compliance processes. Enterprise management methodologies concern the development of executive committees, the determination of core processes, and funding priorities (Weill & Ross, 2005). Metric and compliance processes consist of the joint estimation, measurement, and communication of the value of IT-enabled business processes (Weill & Ross, 2005). Research from this stream focuses on the identification of several IT governance mechanisms adopted by organizations for the deployment of a global IT governance

framework. Research in this stream often describes the implementation of IT governance within organizations (e.g., Bhattacharjya & Chang, 2007; De Haes & Van Grembergen, 2009; De Haes, Gemke, Thorp, & Van Grembergen, 2011; Grüttner, Pinheiro, & Itaboraphy, 2010; Weill & Ross, 2004) or is normative and proposes frameworks and guidelines for the implementation of IT governance (e.g., Dahlberg & Kivijärvi, 2006; Dahlberg, Lahdelma, & Pirkko, 2007; Fink, 2008; IT Governance Institute, 2005). There is a third stream of research that focuses on the evaluation of IT governance mechanisms and the assessment of their impact in achieving organizational goals. The majority of research in this stream focuses on the side effect of IT governance mechanisms on strategic alignment (e.g., Beimborn, Schlosser, & Weitzel, 2009; De Haes, Van Grembergen, & Wim, 2009; Kuruzovich, Basselier, & Sambamurthy, 2012; Preston & Karahanna, 2009; Schlosser & Wagner, 2011), significantly less research addresses organizational performance.

IT governance and organizational performance

Effective IT governance is associated with IT business value (IT Governance Institute, 2008; Weill & Ross, 2004); that is, IT contribution to organizational performance (Melville, Kraemer, & Gurbaxani, 2004). Table 1 summarizes the relevant research done in this regard. For instance, Boritz and Lim (2007) showed that firms with a higher percentage of managers and board members with IT knowledge are more likely to exhibit effective IT governance in the form of CIO position and IT strategy committee and higher levels of financial performance. Similarly, Jewer and McKay (2012) argue that the extent to which IT contributes to firm performance is a function of the level of board involvement in IT governance. However, Liang et al. (2011) emphasize the need to consider a balance in the structure, processes, and relational mechanism mix as an overall IT governance approach and show that the maturity of IT governance enables strategic alignment and achieves higher levels of performance. Bradley et al. (2012) note that effective IT governance has a significant impact on IT contribution to hospital performance by improving market responsiveness, external relationship management, and operational IT effectiveness. Moreover, the authors' findings suggest that IT governance is a fundamental enabler of IT effectiveness and a predictor of IT-generated business value. Prasad, Heales, and Green

(2010) demonstrate that an effective IT steering committee as an IT governance initiative assures benefits at process and firm levels by improving performance.

In summary, IT governance positively affects organizational performance in past research. However, limited work has provided insight into the relationship between IT governance and organizational performance. Research on the subject remains in an early stage and requires additional investigation and theoretical foundation (Lazic et al., 2011). Lazic et al. (2011) are among the few researchers who attempt to explain the positive impact of IT governance on firm business performance. The authors show that a high maturity level of IT governance processes, structures, and relational mechanisms increase IT resources and business process relatedness and achieve cross-business synergies that improve overall business performance.

This study proposes a theoretical model based on the dynamic perspective view and IT governance past research findings to fill the research gap and to further explain the positive impact of IT governance on organizational performance.

Article 2 - Table 1. Summary of the Studies Addressing IT Governance Effect on Organizational Performance

Authors	Research question/objective	Theoretical framework	Methodology	Variables or key concepts	Main results or arguments
(Boritz & Lim, 2007)	Examine whether top management's IT knowledge and the firm's use of important IT governance mechanisms reliably contribute to a firm's financial performance.	IT Governance literature: Academic and Professional literature	Analysis of quantitative secondary data (using compustat database)	- *Top management's IT knowledge* Use of ITG mechanisms : - *IT strategy committee* - *CIO position* - *Financial performance*	• IT knowledge at top executive levels and the board is associated with a company's use of IT governance mechanisms such as CIOs and IT strategy committees that lead to improved financial performance.
(Prasad et al., 2010)	Propose that firm's IT-related capabilities generated through IT governance initiatives should improve business processes and firm-level performance.	Resource-based view (RBV)	Online field survey N = 216 senior executives	- *IT steering committee* IT-related capabilities: - *Top management commitment* - *Shared organizational knowledge* - *Flexible IT infrastructure* Performance: - *Internal process performance* - *Customer*	• Results suggest that firm effectiveness in IT steering committee-driven IT governance initiatives positively relates to the level of their IT-related capabilities. Authors also found positive relationships between IT-related capabilities and internal process-level performance. • Results also support that improvement in internal process-level performance positively relates to improvement in customer service and firm-level performance.

Authors	Research question/objective	Theoretical framework	Methodology	Variables or key concepts	Main results or arguments
				service process performance - *Firm performance*	
(Liang et al., 2011)	How intra-organizational coordination can build goal congruence through strategic alignment and hence achieve higher organizational performance.	Coordination theory strategic alignment	Field survey (mail and online) Business and IT high-level executives N = 334 pairs (167 organizations)	- *IT governance structure type* - *Maturity of IT Governance* - *Strategic alignment* - *Organizational performance*	• The maturity of IT governance, decision level, and IT professional-orientation in IT governance (IT governance structure type) enable strategic alignment, which in turn yields better organizational performance, particularly in the learning and growth aspect of organizational performance.
(Lazic et al., 2011)	Propose a framework to explain the positive impact of IT governance on the business performance of the firm.	RBV and the theory of complementarities	11 case studies Senior IT executives of multinational corporations	- *IT governance* <u>Resource relatedness</u>: *IT relatedness* *Business process relatedness* - *Business performance*	• Results showed that IT governance is positively related to the business performance of a firm. • The study further revealed how the creation of value through IT governance occurs through increases in IT relatedness and business process relatedness.
(Jewer & McKay, 2012)	Propose that the extent to which IT contributes to firm performance is a function of the level	Strategic choice and institutional theories	10 interviews with corporate directors Electronic Field survey	- *Board attributes* - *Organization factors* - *Board*	• The proportion of insiders, board size, IT competency, organizational age, and the role of IT influence the board's level of involvement in IT

Authors	Research question/objective	Theoretical framework	Methodology	Variables or key concepts	Main results or arguments
	of board involvement in IT governance.		N = 188 directors	*involvement in IT governance* - *IT contribution to organizational performance*	governance. • Board IT governance has a positive impact on the contribution of IT to organizational performance.
(Bradley et al., 2012)	Examine antecedents to IT governance and its impact on risk management and IT contribution to hospital performance	Literature on IT governance Literature concerning power and politics and capability management	Field survey N = 164 CIOs of US hospitals	<u>IT governance antecedents</u>: - *CIO structural power* - *IT business mutual participation* - *Entrepreneurial culture* <u>IT governance consequences</u>: - *Risk management* - *IT contribution to hospital performance*	• The results have implications for hospitals' readiness and predisposition for IT governance because their structural and relational mechanisms can affect IT governance and, indirectly, IT value creation. • The findings underscore the importance of capability management and highlights the role of IT governance in IT value creation by instantiating elements of both risk management and ITs contribution to hospital performance as consequences of IT governance.

Theoretical background: IT governance as a dynamic capability competence – A dynamic capabilities approach

The dynamic capabilities framework was developed partially in response to limitations of the resource-based view (RBV), which is recognized as a static firm theory and limited in its applicability to dynamic environments (Teece, Pisano, & Shuen, 1997; Wade & Hulland, 2004). Specifically, dynamic capabilities refer to *"the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments*" (Teece et al., 1997, [p. [517]). Dynamic capabilities thus extend and modify the resource and capabilities base of an organization to meet business needs (Ambrosini, Bowman, & Collier 2009). This is also the case for the IT function. Achieving sustainable competitive advantage through IT is the goal of the organizational IT function and is accomplished by developing strategic IT management capability (Peppard & Ward, 2004). It is through IT governance processes and structures that the formalization and institutionalization of strategic IT decision making and IT monitoring procedures are embedded in organizations (Peterson, 2004a).

The IT governance institute defines IT governance as a dynamic, continuous process (IT Governance Institute, 2008). The operationalization of this dynamic process occurs through the implementation of IT governance mechanisms such as structures, processes, and relational mechanisms (Peterson, 2004a) . These supporting mechanisms refer to IT-related decision-making structures and methodologies to plan, organize, and control IT activities (Prasad et al., 2010).

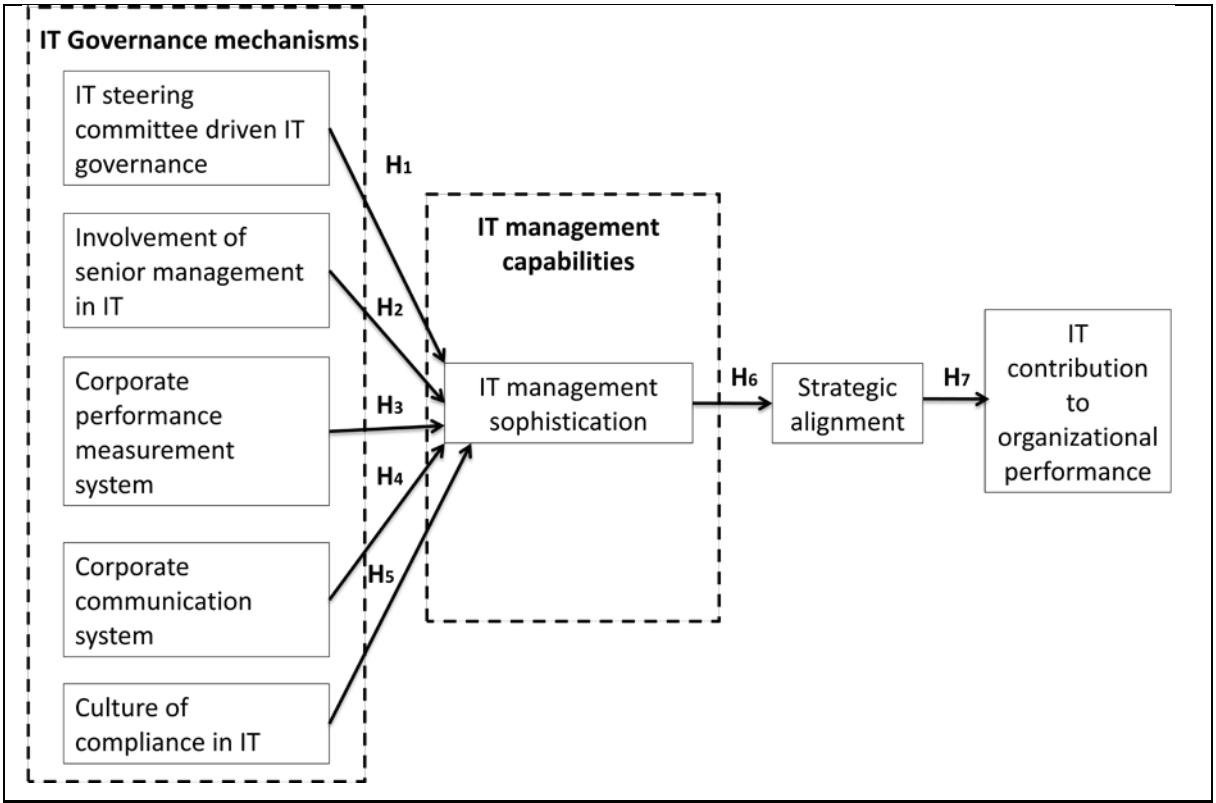
Based on the dynamic capabilities perspective, we consider IT governance as a dynamic capability competence that focuses through its mechanisms (structures, processes, and relational mechanisms) on the reconfiguration of existing IT management capabilities to better support business objectives and strategies for improved organizational performance.

Research model and hypotheses

Figure 1 presents the research model that examines the relationship between IT governance and organizational performance through the IT governance effect on IT contribution to organizational performance. We further propose that IT management sophistication and strategic alignment mediate the positive effect of IT governance on performance.

We consider IT governance as an overarching initiative encompassing the three aspects of IT governance: 1. IT governance structure through senior management involvement in IT and the development of executive committee driven IT governance. 2. IT governance processes concerned with the establishment of a corporate performance measurement system encompassing the metrics and evaluation processes of the IT function. 3. The use of a communication system as a proxy of relational mechanisms that focus on informing business managers and IT staff of established IT governance processes.

These mechanisms were associated with effective IT governance in past research (Ali & Green, 2005; De Haes & Van Grembergen, 2009; Ferguson, Green, Vaswani, & Wu, 2013; IT Governance Institute, 2003; Prasad et al., 2010). We argue that IT governance as a dynamic capability competence will positively affect the overall level of IT management capability of the organization (IT management sophistication), which, in turn, will lead to superior strategic alignment and, therefore, improvement in IT contribution to organizational performance (Ali and Green, 2005, De Haes & Van Grembergan, 2009a; Ferguson et al. 2013, IT Governance Institute, 2003, Prasad et al., 2010). Figure 1 provides theoretical support for the inclusion of the above-mentioned mechanisms and the related hypotheses.



Article 2 - Figure 1 Research Model

IT governance mechanisms effects on IT management capability effectiveness

Drawing on the dynamic capabilities perspective, we consider IT governance to be a dynamic capability competence that, through its mechanisms, focuses on the renewal, reconfiguration, and re-creation of IT management capability to address the (internal and external) environmental change. By extending IT governance prior research, we address the following IT governance mechanisms because they are considered effective in driving organizational outcomes. These mechanisms can be indicative of the sophistication of an organization's IT management capability: the IT steering committee, involvement of senior management in IT, the corporate performance management system, the corporate communication system, and the culture of compliance in IT.

STEERING COMMITTEE-DRIVEN IT GOVERNANCE AND IT MANAGEMENT SOPHISTICATION

Structural mechanisms, such as an IT steering committee, can affect IT management sophistication by providing organizational structures that support the development and evolution of the organization's IT management capability in line with strategic goals and

objectives (IT Governance Institute, 2003; Karimi, Bhattacherjee, Gupta, & Somers, 2000; Peterson, 2004b; Prasad, Heales, & Green, 2010). The effects of these structural mechanisms include the effective coordination and integration of IS planning activities (Bowen, Cheung, & Rohde, 2007; De Haes & Van Grembergen, 2008; Gupta & Raghunathan, 1989; Raghunathan, Raghunathan, 1989), advanced IS budget and planning practices (Doll & Torkzadeh, 1987), and increased managerial support and funding (Doll & Torkzadeh, 1987; Torkzadeh & Xia, 1992), develop and sustain the firm's IT-related management and infrastructure capabilities (Prasad et al., 2010) for greater IT success (Huang et al., 2010). Additionally, a study by Karimi et al. (2000) provides a positive relationship between the presence and roles of IT steering committees and the level of IT management sophistication. Based on these arguments, we present the following hypothesis:

H_1: *Effective steering committee-driven IT governance is positively associated with IT management sophistication*.

Involvement of senior management in IT and IT management sophistication

IT governance requires a higher level of management involvement (Prasad et al., 2010). Top management involvement and support for IS can enhance the effectiveness of IS in organizations (Kuruzovich et al. 2012). Moreover, top management commitment enhances IT successes as they make IT resources available, support and guide the IS functions, and integrate IT with business strategy and processes (Powell & Dent-Micallef, 1997). Executive management's support for IT-related initiatives promotes agility and leadership in exploiting and managing IT (Earl, 1993; Torkzadeh & Xia, 1992). Thus, we argue that senior management involvement in IT constitutes a significant incentive for IT management sophistication and present the following hypothesis:

H_2: *Involvement of senior management in IT is perceived to positively influence IT management sophistication*.

Corporate performance measurement system and IT management sophistication

Corporate performance measurement systems, such as the balanced scorecard, should allow enterprises to drive their strategies on measurement and follow-up strategies at the

enterprise level (Kaplan & Norton, 1992). The principles of corporate performance measurement systems had also been applied to the IT function and its processes via the use of the IT balanced scorecard (Van Grembergen, 2000; Van Grembergen & Van Bruggen, 1997; Willcocks, 1995). The use of such governance process is widely recognized as useful with respect to management control of IT success (Van Grembergen, 2000; Van Grembergen, Saull, & De Haes, 2003). Hardy (2003) contends that the use of a performance management system is an integral part in applying effective IT governance. By establishing metrics that are linked to the IT strategy, corporate performance measurement systems provide management with a regular and precise analysis of IT performance in current operations and the latest projects (Ali & Green, 2007). For instance, the use of a corporate performance measurement system such as a balanced scorecard is associated with superior IT service delivery performance including e-government service delivery (Lawson-Body, Keengwe, Mukankusi, Illia, & Miller, 2008). The effective use of a corporate performance measurement system as management tool also leads to superior strategic alignment through the assessment of IT management practices and their monitoring to better serve business needs (Chang & King, 2003; Decoene & Bruggeman, 2006; Hu & Huang, 2006; Huang & Hu, 2007), Thus we state that:

H_3: *The implementation of* a *corporate performance measurement system positively influences IT management sophistication*.

CORPORATE COMMUNICATION SYSTEM AND IT MANAGEMENT SOPHISTICATION

Corporate communication systems are considered among the most important IT governance practices by past research (Ali & Green, 2007, 2012; De Haes & Van Grembergen, 2008; De Haes & Van Grembergen, 2009a). The use of corporate communication systems may enhance the effectiveness of the IT function as a whole by enabling knowledge sharing and knowledge integration between the business and IT to provide insights into both areas. This dynamic creates effective participation and collaboration in firm on IT management issues (Luftman, 2004; Luftman & Brier, 1999; Preston & Karahanna, 2009). Moreover, effective communication systems enable the two parties (business and IT) to increase awareness of the significance of each party's perspective on the benefits provided by IT (De Haes, 2007). Consistent with these arguments, we consider that IT governance mechanisms will

contribute to IT management sophistication through the establishment of formal communication procedures concerning IT governance and management. Accordingly:

H_4: *The implementation of a corporate communication system positively influences IT management sophistication*.

A CULTURE OF COMPLIANCE IN IT AND IT MANAGEMENT SOPHISTICATION

Past research reports that the existence of a culture of compliance in IT is associated with a higher level of IT governance effectiveness (Ali & Green, 2005, 2012). As part of a holistic IT governance approach, a continual compliance program maintains an awareness of the latest regulatory and legislative requirements with the identification of their impact on IT processes (Pinder, 2006). As a consequence, IT management must implement adequate IT controls to meet these business and regulatory requirements (Hardy, 2006). Thus, we argue that:

H_5: A *culture of compliance in IT is positively associated with IT management sophistication*.

The relationship between IT management sophistication and strategic alignment

IT management capability refers to the ability of a firm to manage IT resources to deliver business value (Kim, Shin, & Kwon, 2012). Early research defined the concept of IT management sophistication to capture the overall level of IT management capability in organizations (Gupta, Karimi, & Somers, 1997; Karimi et al., 2000; Karimi, Gupta, & Somers, 1996; Karimi, Somers, & Gupta, 2001). The ability to achieve strategic alignment is built upon a specific set of IT management competencies (Gupta et al., 1997). Moreover, strategic alignment is contingent upon the extent to which the evolution of IT management practices support business goals as a firm adapts to a changing environment over time (Huang, 2012). Additionally, greater IT management sophistication denotes increased formalization of a company's IT-based activities indicating that the IT function has evolved from a data processing orientation to a strategic orientation (Gupta et al., 1997) and is, therefore, closely integrated into the company's business strategy (Liu, Jing, & Huang, 2005). Therefore, we argue that:

H_6: *IT management sophistication is positively associated with IT strategic alignment.*

The relationship between strategic alignment and IT contribution to organizational performance

Strategic alignment examines the link between IT strategy and business strategy (Sabherwal, Hirschheim, & Goles, 2001). Past research found that strategic alignment is necessary to allow organizations to capitalize on their IT investments and derive value (Chan, Huff, Barclay, & Copeland, 1997; Sabherwal & Chan, 2001). Empirical work and case studies have repeatedly shown that business and IT performance improve when firms experience strategic alignment (Chan & Reich, 2007). The positive impact of alignment on organizational performance continues to be found (Avison, Jones, Powell, & Wilson, 2004; Celuch, Murphy, & Callaway, 2007; Schwarz, Kalika, Kefi, & Schwarz, 2010). This relationship is explained noting that when alignment occurs, IT is used in a more focused and strategic manner, and that improves organizational performance (Chan, Sabherwal, & Thatcher, 2006). "The value that IT adds to the business is a function of the degree to which the IT organization is aligned with the business and meets the expectations of the business" (IT Governance Institute, 2003, p. [25]). Conversely, failure to leverage IT may seriously hamper a firm's performance and viability (Venkatraman, 2000; Weill & Broadbent, 1998). Therefore, we present the following hypothesis:

H_7: S*trategic alignment is positively related to the contribution of IT to organizational performance*.

RESEARCH METHODOLOGY

Survey development

We developed a survey instrument with measurement items that were adapted from existing scales (see table 2 below). All survey items were scored using a seven-point Likert-type scale and anchored by "not at all" (1) and "to a great extent" (7) or "strongly disagree" (1) and "strongly agree" (7). Table 2 summarizes the operational definition of the survey constructs. All constructs and items are listed in Appendix A.

Article 2 - Table 2. Definitions and Measurement Sources of the Survey Constructs

Constructs Dimensions	Definition	Source
IT steering committee-driven IT governance	Effectiveness of the steering committee according to the roles of the steering group, policy committee, and IT board.	(Prasad et al., 2010)
Involvement of senior management in IT	Senior executive involvement in IT strategic decision making	(Ferguson et al., 2013)
Corporate performance measurement systems	Extent to which the features of corporate performance measurement systems and their use for IT control and management are performed by the organization	(Ferguson et al., 2013)
Corporate communication systems	Use of corporate communications systems to communicate and educate the organization's members about IT governance decisions and processes	(Ali & Green, 2007)
Culture of compliance in IT	Presence of a corporate compliance program or activities related to the achievement of IT objectives	(Ali & Green, 2012)
IT management sophistication (encompasses the following IT management capabilities)	The ability of an organization to manage IT resources to deliver business value	(Kim et al., 2011)
IT planning	The level at which the planning of IT deployment and utilization is structured according to formal and informal procedures	
IT investment decision making	The level at which investment decision-making concerning IT resources is structured according to formal and informal	

Constructs	Dimensions	Definition	Source
		procedures	
IT coordination		The level at which coordination efforts between IT staff and business clients are structured according to formal and informal procedures	
IT control		The level at which IT control activities (e.g., development, management, and operation) are structured according to formal and informal procedures	
Strategic alignment		The extent of congruence of the business strategy and IT strategy	(Preston & Karahanna, 2009;Valorinta, 2011)
IT contribution to organizational performance		Self-reporting of the extent to which IT contributes to customer satisfaction, process improvement, operating efficiency, and cost savings	(Jewer & McKay, 2012)

The measurement of the IT contribution to organizational performance construct requires little comment. This construct reflects self-reporting of the extent to which IT contributes to organizational performance. We choose to adopt subjective rather than objective measures or a combination of both to assess organizational performance because of the respondents' profiles (IT executives), who are more knowledgeable of this type of organizational performance indicator. Richard, Devinney, Yip, and Johnson (2009) state "subjective measures ask supposedly well-informed respondents (key informants) about organizational performance. This allows them to be strongly tailored to the dimensionality of the context of interest." (p.[734]). In past research, the correlation between subjective and objective measures of organizational performance has been high (Wall et al., 2004). Thus, we assume that organizations with superior subjective measures of organizational performance would also exhibit superior objective measures such as financial metrics.

Sampling and data collection

We collected study data through a field survey. Respondents were chosen based on their position, experience, and professional knowledge rather than a traditional random sampling procedure (Segars & Grover, 1999). The survey was launched in North America (US and Canada) through a sampling service company to ensure a maximum number of respondents that meet the selection criteria. The respondents included high-level executives such as CIOs, IT directors, and senior managers. With their practical experience and organizational position, such key informants provide reliable information on firm characteristics less biased by personal attitudes or behaviors. Access to these key informants is facilitated by rigorous and systematic selection criteria as a baseline for sample selection (e.g., High level IT executives, medium to large organizations) and communicated to the sampling service company that launched the survey. Moreover, we added selective questions at the beginning of the questionnaire as an additional procedure to filter respondents with access to the survey. This allowed the exclusion of potential respondents who did not meet the selection criteria for this study. As additional selection criteria, we targeted medium to large organizations. This criterion was motivated by the need for organizations with a formal and sizable IT function. Thus, such firms are more suited to this study because they are more likely to possess an established IT governance structure. Once the survey was launched, we verified the completed questionnaires online. Overall, 205 IT executives responded to the survey. We eliminated five responses from the dataset because they were incomplete. Thus, the final sample consisted of 200 responses. The response rate is difficult to determine because the survey was administered via a sample service company. To check for non-response bias, we compared the profiles of early and late respondents to identify any significant differences in terms of demographic characteristics (organization size and respondents' experience in general IT management) and responses to principle constructs. Early respondents were identified by selecting those that responded during the first two weeks of the survey launch. All t tests between the means of the two groups showed no significant differences ($P < 0.05$ level). Appendix B provides an overview of the general characteristics of the 200 responses that were included in the final analysis. The organizations in the sample represent diverse industry groups. Appendix B shows that 20.1 percent of the responding organizations are from the manufacturing industry; 21.6 percent

are from the IT consulting service industry; 10.4 percent are from the financial services, banking, and insurance industries; 9.5 percent are from the retail industry; and 7 percent are in the education, health care, as well as in Biotechnology industries. The average number of people employed in these organizations is 4,139, the average number of IT employees in these organizations is 337, and the average ratio of IT budget to total company budget of these organizations is 10.5 percent. A total of 39.1 percent of the respondents is either a chief information officer (CIO) or a vice president of the IT division. A total of 38.1 percent of respondents is a senior IT manager and 22.8 percent are IT directors. All respondents indicate that they are among the high-level executives of their organizations.

Data analysis and results

Measurement model validation

Consistent with prior studies (Bradley et al., 2012; Kim et al., 2011), we assessed the validity and reliability of the model items and constructs. Reliability verification of the measurement model was conducted with confirmatory factor analysis (CFA) using Mplus version 6.11. In the initial examination of the measurement model, we checked for construct validation of first-order indicators. The initial CFA results required re-specification to achieve a good fit. After one iterative modification that dropped items with low or cross loadings, the fit indices met the criteria. The normed chi-square for the measurement model (X^2/df) was 1.478, which is below the suggested cut-off value of 3.0. The RMSEA (Root Mean Square Error of Approximation) was 0.049, which is below the 0.08 cut-off value and indicates a satisfactory model fit. CFI (Comparative Fit Index) and TLI (Tucker Lewis Index) indices were 0.929 and 0.919, respectively, both above the cut-off values of 0.90 for the continuous outcomes case (Hu & Bentler, 1999). Additionally, we used the SRMR (standardized root mean square residual) as an index for badness-of-fit. The SRMR for the measurement model, 0.052, is well below the suggested threshold of 0.08, providing further support for the model fit. These results suggest that the measurement model adequately fits the data (Byrne, 2013). Fit indices appear in Appendix D. The item-to-construct loadings were statistically significant at the 0.001 level as shown in Appendix C, thus confirming their uni-dimensionality and validity for the constructs. Moreover, the t-values for factor loadings of manifest variables were well above two,

supporting the statistical significance of factor loadings. Appendix C provides a detailed correlation matrix of the measures.

Consistent with prior studies (Bradley, Pridmore, & Byrd, 2006; Kim et al., 2011), we assessed the reliability of our scales using composite reliability (Werts, Linn, & Jöreskog, 1974) and Cronbach's α (Nunnally, 1978) . Composite reliability, which is analogous to Cronbach's α, offers a better estimate of variance shared by the respected indicators because it uses the items loadings obtained within the nomological network (Hair, Anderson, & Tatham, 2009). Moreover, composite reliability is perceived as a stronger reliability assessment when compared to Cronbach's α and is considered a more conservative test of reliability (Garver & Mentzer, 1999). Table 2 shows that the composite reliability scores for all scales exceed the often-cited level of 0.70 (Kline, 2011; Nunnally & Bernstein, 1994). Moreover, the Cronbach's α of each construct is above 0.7 (table C-1 in appendix C). Thus, both measures are acceptable meaning that our constructs are considered reliable.

We also assessed convergent validity of our constructs using Fornell and Larcker's (1981) average variance extracted (AVE) criterion. The AVE measures the average amount of variance that a construct captures from its indicators relative to the amount of measurement error. As listed in Table 3, the AVE for each construct exceeds the minimum threshold value of 0.50 (Chin, 1998; Fornell & Larcker, 1981) implying that at least 50 percent of the variance in the indicators is accounted for. Table 3 shows that the measures exhibit satisfactory convergent validity for all scales used in this study.

Discriminant validity was tested in accordance with the procedure described by Fornell and Larcker (1981). Evidence of discriminant validity occurs when the square root of the AVE is greater than the correlations between constructs in the research model. The requirement for discriminant validity were met for four scales (ITSTEER, INVOLVE, ITPL, STRATAL and ITCONTRP) and acceptable for one (COMSYS), while the correlation of CORPSYS, ITCOMPL, ITIV, ITCO and ITCR (off-diagonal elements in Table 4) exceeded their respective value of square root of AVE (bold diagonal elements in Table 4).

Article 2 - Table 3. Average Variance Extracted of Principle Constructs

Construct	N	AVE	Reliability (no. of items)	Mean	S.D.
ITSTEER	200	0.63	0.87 (4)	5.41	1.21
INVOLVE	200	0.68	0.81 (2)	5.33	1.21
CORPSYS	200	0.60	0.88 (5)	5.47	1.04
COMSYS	200	0.68	0.89 (4)	5.51	1.21
ITCOMPL	200	0.63	0.84 (3)	5.52	0.98
ITPL	200	0.72	0.84 (2)	5.62	1.10
ITIV	200	0.55	0.78 (3)	5.66	0.96
ITCO	200	0.67	0.89 (4)	5.46	1.17
ITCR	200	0.62	0.86 (4)	5.64	1.03
STRATAL	200	0.65	0.90 (5)	5.66	1.03
ITCONTR	200	0.60	0.75 (2)	5.79	0.87

ITSTEER = IT steering committee; INVOLVE = Involvement of senior management in IT; CORPSYS = Corporate performance measurement system; COMSYS = Corporate communication system; ITCOMPL = Culture of compliance in IT; ITPL = IT planning; ITIV= IT investment decision making; ITCO = IT coordination; ITCR = IT control; STRATAL= Strategic alignment; ITCONTR = IT contribution to organizational performance.

Article 2 - Table 4. Construct Correlations

Constructs	1	2	3	4	5	6	7	8	9	10	11
1. ITSTEER	**0.79**										
2. INVOLVE	0.55	**0.82**									
3. CORPSYS	0.77	0.71	**0.78**								
4. COMSYS	0.58	0.71	0.79	**0.83**							
5. ITCOMPL	0.60	0.73	0.89	0.83	**0.79**						
6. ITPL	0.51	0.59	0.72	0.68	0.67	**0.85**					
7. ITIV	0.58	0.65	0.75	0.71	0.71	0.75	**0.75**				
8. ITCO	0.58	0.77	0.78	0.66	0.75	0.75	0.77	**0.83**			
9. ITCR	0.55	0.74	0.77	0.67	0.78	0.83	0.83	0.88	**0.79**		
10. STRATAL	0.55	0.66	0.76	0.61	0.72	0.75	0.81	0.92	0.91	**0.81**	
11. ITCONTRP	0.47	0.42	0.62	0.57	0.58	0.68	0.76	0.61	0.70	0.74	**0.75**

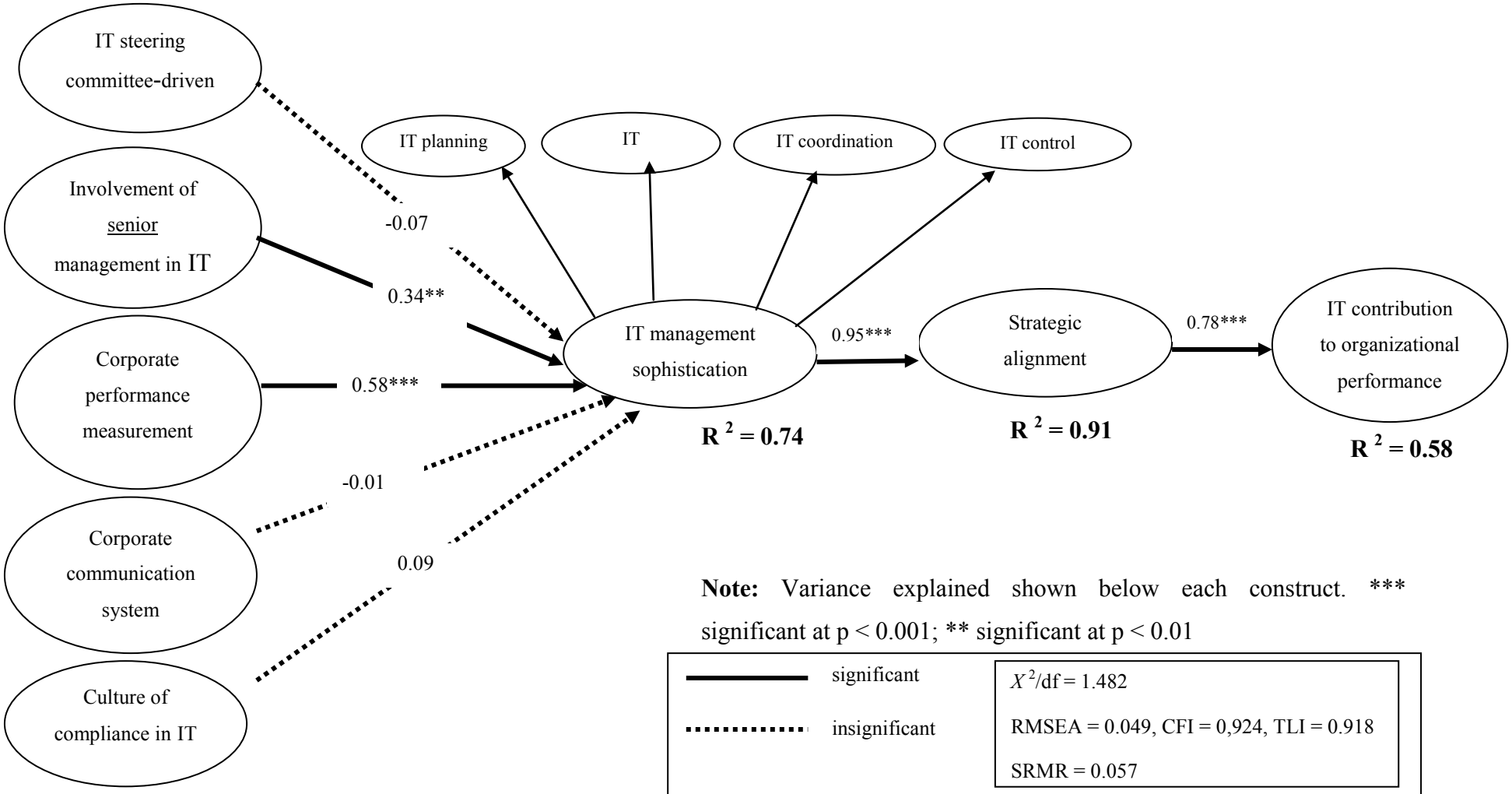
Results of the structural model tests

The research model was also analyzed with Mplus version 6.11. Figure 2 presents the estimation results of the research model including the estimated model parameters and R^2 values for the constructs.

The goodness-of-fit measures for the model showed a satisfactory fit. Appendix D shows that the normed chi-square (X^2/df) was 1.482, which is below the suggested cut-off value of 3.0. CFI, TLI, and RMSEA were 0.924, 0.918 and 0.049, respectively; each indicating a satisfactory model fit. Additionally, the SRMR was 0.057, well below the suggested threshold of 0.08, providing further support for the model fit.

The results show that, strategic alignment is strongly and positively associated with IT contribution to organizational performance ($\beta = 0.78$, $p < 0.001$), thereby supporting hypothesis 7. Second, IT management sophistication exhibits considerable influence on strategic alignment ($\beta = 0.95$, $p < 0.001$), supporting hypothesis 6. Moreover, involvement of senior management in IT ($\beta = 0.34$, $p < 0.01$) and corporate performance measurement system ($\beta = 0.58$, $p < 0.001$) have significant and positive effects on IT management sophistication, thereby supporting hypotheses 2 and 3, whereas hypothesis 1, the positive impact of IT steering committee on IT management sophistication, is not statistically significant. Finally, we do not find a direct positive effect of corporate communication systems and a culture of compliance in IT on IT management sophistication. Thus, hypotheses 4 and 5 were not confirmed in this research.

Article 2 - Figure 2 Estimated Research Model



Note: Variance explained shown below each construct. *** significant at $p < 0.001$; ** significant at $p < 0.01$

significant

insignificant

X^2/df = 1.482

RMSEA = 0.049, CFI = 0,924, TLI = 0.918

SRMR = 0.057

DISCUSSION OF RESULTS

Figure 2 depicts the path analytic model that summarizes the results of the model. The dotted lines represent non-significant paths.

Contrary to hypothesis 1, the direct influence of the IT steering committee on IT management sophistication was negative and not significant in this study. Thus, hypothesis 1, which proposes that the effectiveness of IT steering committees is directly positively correlated with the overall level of IT management sophistication, could not be supported. This finding is inconsistent with previous studies (Karimi et al., 2000) that found that IT steering committees positively influence the level of IT management sophistication. A possible explanation for this finding could be that the organizations in this study do not consider IT a critical factor for their organizations' business success and/or a core competitive process for their organizations (i.e. the organization is outsourcing its IT functions). Another explanation may be the use of the conceptualization of Prasad et al. (2010) for the IT steering committee variable. The authors defined it as a single construct combining seven items initially used by Karimi et al. (2000) to measure three distinct roles of IT steering committees: steering group, policy committee, and IT board. Our choice of using Prasad et al.'s conceptualization of the IT steering committee construct is motivated by Karimi et al.'s (2000) findings on the minimal differences in the impacts of the three groups on IT management sophistication. However, the use of a single construct for IT steering committees seems to provide respondents with mixed perceptions or ambiguity concerning the IT steering committee role.

The involvement of senior management in IT had a significant and positive effect on the perceived overall level of IT management sophistication, which suggests support for hypothesis 2. This finding is consistent with previous studies by Earl (1993), Cerpa and Verner (1998), Sohal and Ng (1998) and Prasad et al. (2010). Top management support for IT-related initiatives enhances IT success by making IT resources available and by supporting and guiding the IS functions (Prasad et al. 2010).

The result obtained concerning the positive effect of the corporate performance measurement system on IT management sophistication is highly significant and is in the

hypothesized direction, thus providing support for hypothesis 3. This result indicates that the use of corporate performance measurement systems that incorporate metrics to provide management with a regular and empirical view of IT performance in current operations and new projects is positively associated with a higher level of IT management sophistication. The results, therefore, lend empirical support to previous research advocating the development and implementation of corporate performance measurement systems to monitor the effectiveness of the IT function and its strategies based on measurement and follow-up (Hu and Huang, 2006; Van Grembergen, 2000; Van Grembergen et al., 2003).

Contrary to hypothesis 4, a non-significant relationship was found between corporate communication systems usage in organizations and the overall level of IT management sophistication. The impact of such relational mechanisms in the IT governance context has also yielded mixed results in previous studies, mainly in relation with strategic alignment (De Haes & Van Grembergen, 2009). We posit IT management sophistication as a significant predictor of strategic alignment and found no significant evidence of the impact of corporate communication system mechanisms on IT management sophistication.

Similarly, the results provide no support for hypothesis 5, which proposes that a culture of compliance in IT is positively associated with IT management sophistication. Although past research reported a positive relationship (Ali and Green, 2012, Ali and Green 2005), other research states that the presence of an IT compliance program is perceived as binding to comply with new regulation and legislation. This is particularly the case when organizations are not directly affected by such regulation but have to consider compliance because they must demonstrate a similar degree of internal control as their business partners (Hu et al., 2007; Pinder, 2006). This may explain the non-significant relationship obtained between a culture of IT compliance and the level of IT management sophistication.

Our analysis of the survey data confirmed that IT management sophistication constitutes the principle predictor of strategic alignment in organizations (hypothesis 6). This finding supports prior literature that contends that IT management sophistication is a key determinant of strategic alignment achievement in organizations (Huang, 2009; Karimi et al., 2000).

Finally, we found a significant and positive relationship between strategic alignment and the contribution of IT to organizational performance (hypothesis 7). Strategic alignment explained 78 percent of the variance in IT contribution to organizational performance.

In sum, the use of a corporate performance measurement system as an IT governance mechanism has a greater effect on IT management sophistication followed by the involvement of senior management in IT. No support was found for a positive effect of other IT governance mechanisms selected in this study on IT management sophistication. Although such mechanisms have been considered effective by past research, we do not find support for their positive direct impact on IT management sophistication in this study. Further research could investigate other IT governance mechanisms' impact on IT management sophistication.

CONTRIBUTIONS AND IMPLICATIONS FOR THEORY AND PRACTICE

Contributions for theory

This study proposes a theoretical model that links IT governance with organizational performance. The theoretical model can be viewed as an early step in understanding IT governance impacts on organizational performance. First, this research contributes to theory by responding to the recognized need for additional research that considers the ensuing impact of IT governance on IT contribution to organizational performance (Prasad et al., 2010). From a theoretical perspective, the extant literature does not adequately describe and explain how IT governance may affect organizational performance. This research contributes by developing and testing a theoretic model to describe and explain how IT governance relates to organizational performance.

Second, the findings in this study expand the dynamic capabilities perspective to include the IT domain and present IT governance in the form of a dynamic capability that conducts greater performance through IT management sophistication and strategic alignment. IT governance is presented as a powerful force in positively enabling IT management sophistication, leading to superior strategic alignment as a consequence. The implications cascade through the organization and affect IT contribution to organizational performance.

Specifically, we found that IT governance, through its mechanisms such as the use of corporate performance measurement systems and the involvement of senior management in IT, exhibits higher levels of IT management sophistication. Moreover, IT management sophistication constitutes the principle predictor of strategic alignment confirming that a strategically oriented IT function drives strategic alignment. Finally, improvements in strategic alignment imply superior contribution of IT to organizational performance.

Implications for practice

The study findings have practical implications for IS and business practitioners. Above all, IT governance should be understood from the perspective of its ability to strengthen organizational IT management sophistication. As such, the way IT governance mechanisms influence the level of IT management sophistication may constitute an indicator of a firm's effective use of IT management capabilities. Second, IS and business practitioners should recognize that IT management sophistication represents a valuable predictor of strategic alignment in organizations. Therefore, IT and business executives should focus on IT management sophistication enabling strategies that will, in turn, increase the contribution of IT to organizational performance.

Limitations and future research

This study has limitations that provide opportunities for further research. This study attempts to apply the dynamic capabilities perspective on the IT domain by presenting IT governance as a dynamic capability competence. However, we focused only on a selected set of IT governance mechanisms considered effective by past research. Many more studies are required to identify the mechanisms by which IT governance can foster IT contribution to organizational performance.

Moreover, the use of IT governance practices may differ according to the type of industry. Therefore, future research could focus on one sector to control the contingencies resulting from industry differences and to determine if this changes the findings of this study. A focus on one industry could particularly change results concerning IT governance

mechanisms' impact on IT management sophistication as this later is usually oriented by business objectives.

Finally, this study examined the impact of IT governance mechanisms on IT management sophistication as a whole. Future study could investigate the influence of such mechanisms on the different dimensions of IT management capabilities, such as IT planning or IT control.

CONCLUSION

This study proposes a theoretical model that relates IT governance to organizational performance. We draw upon the dynamic capabilities perspective to present IT governance as a dynamic capability competence that focuses, through its mechanisms, on the reconfiguration of existing IT management capabilities leading to a higher level of IT management sophistication. The model finds that greater IT management sophistication implies superior strategic alignment. This, in turn, affects the IT contribution to organizational performance. Empirical tests of our hypotheses based on survey data gathered from 200 IT executives of North American organizations show a strong support for the influence of specific IT governance mechanisms, namely, corporate performance measurement system usage and the involvement of senior management in IT on IT management sophistication and its ensuing impact on the abovementioned outcomes. Despite the stated limitations of this research, the findings of this study emphasize the essential role of IT governance in enhancing an organization's IT management capabilities that, in turn, foster strategic alignment and improve IT contribution to organizational performance.

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APPENDIX

Appendix A- List of constructs and items

Items	Questions
IT steering committee (ITSTEER)	
ITSTEER1	The IT steering committee is charged with steering IT activities that are in line with the strategic direction of the organization.
ITSTEER2	The IT steering committee is appointed to take control of the technology from IT specialists.
ITSTEER3	The IT steering committee decides on resource allocation in the areas of system development and/or recruitment for the IT function.
ITSTEER4	The IT steering committee is created to increase visibility and/or to revamp IT.
ITSTEER5	The IT steering committee provides a mechanism for keeping and sustaining necessary reserved powers centrally.
ITSTEER6	The IT steering committee provides a mechanism for IT coordinating requirements and practices.
ITSTEER7	The IT steering committee is formed to solicit the support of top management for IT activities.
Involvement of senior management in IT (INVOLVE)	
INVOLVE1	To what extent does senior management get involved in strategic matters related to the use of IT within the organization, outside of the IT steering committee?
INVOLVE2	To what extent is senior management knowledgeable about IT opportunities and possibilities for the organization?
INVOLVE3	To what extent is senior management knowledgeable about IT innovations that have been developed by major competitors?
INVOLVE4	To what extent does senior management endorse major IT investments that have not been endorsed by traditional justification criteria and procedures (such as the IT steering committee)?
Corporate performance measurement system (CORPSYS)	
CORPSYS1	To what extent does your organization's corporate performance measurement system measure the degree to which the organization's IT strategy supports the business strategy?
CORPSYS2	To what extent does your organization's corporate performance measurement

Items	Questions
	system produce a concise model to assist managers in tracking the organization's progress?
CORPSYS3	To what extent does your organization's corporate performance measurement system provide management with control measures on IT expenses?
CORPSYS4	To what extent does your organization's corporate performance measurement system provide management with control measures on the efficiency of IT development and operations?
CORPSYS5	To what extent does your organization's corporate performance measurement system allow for control measures to be compared with benchmarking figures for IT throughout the business operations?
Corporate communication system (COMSYS)	
COMSYS1	My organization's communication systems enable the organization to inform its employees effectively about the existence of IT governance mechanisms.
COMSYS2	My organization's communication systems enable the organization to inform its employees about IT governance decisions and processes throughout the organization.
COMSYS3	My organization's communication systems provide support in educating the organization's members on IT governance processes in the organization.
COMSYS4	My organization's communication systems disseminate IT governance principles, policies, and outcomes of IT decision making processes throughout the organization.
Culture of compliance in IT (ITCOMPL)	
ITCOMPL1	To what extent does your organization's compliance program/activities enable the organization to achieve its IT objectives?
ITCOMPL2	To what extent does your organization's compliance program/activities enable the circumvention of any violation that could hinder the organization to achieve its IT objectives?
ITCOMPL3	To what extent does top management provide leadership in compliance program/activities related to IT objectives?
ITCOMPL4	To what extent does your organization's compliance program/activities enhance IT controls' design, documentation, and consistency?

Items	Questions
IT Planning (ITPL)	
ITPL1	We continuously examine the innovative opportunities for the strategic use of IT.
ITPL2	We enforce adequate plans for the introduction and utilization of IT.
ITPL3	We perform IT planning processes in systematic and formalized ways.
ITPL4	We frequently adjust IT plans to better adapt to changing conditions.
IT investment decision-making (ITIV)	
ITIV1	When we make IT investment decisions, we think about and estimate the effect they will have on the quality and productivity of the employees' work.
ITIV2	When we make IT investment decisions, we consider and project how much these options will help end users make quicker decisions.
ITIV3	When we make IT investment decisions, we consider and estimate whether they will consolidate or eliminate jobs.
ITIV4	When we make IT investment decisions, we think about and estimate the amount and cost of training that end users will need.
ITIV5	When we make IT investment decisions, we consider and estimate the time managers will need to spend overseeing the change.
IT coordination (ITCO)	
ITCO1	In our organization, IS and line people meet frequently to discuss important issues both formally and informally.
ITCO2	In our organization, IS people and line people from various departments frequently attend cross-functional meetings.
ITCO3	In our organization, IS and line people coordinate their efforts harmoniously.
ITCO4	In our organization, information is widely shared between IS and line people so that those who make decisions or perform jobs have access to all available know-how.
IT control (ITCR)	
ITCR1	In our organization, the responsibility and authority for IT direction and development are clear.
ITCR2	We are confident that IT project proposals are properly appraised.
ITCR3	We constantly monitor the performance of IT function.
ITCR4	Our IT department is clear about its performance criteria.

Items	Questions
Strategic alignment (STRATAL)	
STRATAL1	The co-operation between the IT and business functions works well.
STRATAL2	The IT strategy is congruent with the corporate business strategy in our organization.
STRATAL3	Decisions in IT planning are tightly linked to the organization's strategic plan.
STRATAL4	Our IT management participates actively in business planning.
STRATAL5	Our business strategy and IT strategy are closely aligned.
IT contribution to organizational performance (ITCONTR)	
ITCONTR1	The extent to which IT has contributed to customer satisfaction.
ITCONTR2	The extent to which IT has contributed to process improvement.
ITCONTR3	The extent to which IT has contributed to operating efficiency.
ITCONTR4	The extent to which IT has contributed to cost savings.

Appendix B

Table B-1 Descriptive statistics on respondents

Demographic characteristics		**Frequency (n = 200)**	**Percent (%)**
Title	CIOs	48	24.2
	VPs IT	30	14.9
	IT directors	46	22.8
	Senior IT managers	76	38.1
Education degree	Post-graduate diploma (Ph.D.)	13	6.5
	Master's degree/MBA	69	34.5
	University bachelor's degree	87	43.6
	High school diploma	9	4.5
	Post-graduate certificate/diploma	8	4.0
	Community College/CEGEP	9	4.5
	Other	5	2.4
Gender	Male	133	67.1
	Female	67	32.9
Geographic location	Canada	59	28.8
	US	141	71.2
Number of years of general management IT experience	Less than 5 years	16	7.8
	5 to 10 years	62	30.4
	More than 10 years	122	61.8

Table B-2 Descriptive statistics for organizations

Industry composition					
Industry	**Number**	**Percent**	**Industry**	**Number**	**Percent**
Finance/banking/insurance	21	10.4	Government agencies	13	6.4
Chartered firm/management consulting	7	3.5	Health care/biotechnology	14	7.0
Education	14	7.0	IT consulting services	43	21.6
Energy/mining	3	1.5	Manufacturing & processing	40	20.1
Food/household	1	0.5	Wholesale/retail	19	9.5
Transportation/logistics	7	3.5	Communication/utilities	7	3.5
TV/news/publishing	3	1.5	Other	6	3.0
Tourism & leisure	2	1.0			

Table B-3 Organizational size

Characteristics	**Mean**
Total employees	4139
Total IT employees	337
Ratio of IT budget to total company budget	10.5
Annual sales (US $)	**Percent**
Less than $100 million	13.6
$101 - $300 million	17.6
$301 - $1000 million	26.2
$1001 - $3000 million	12.8
More than $3000 million	22.7
Don’t know	7.1

Appendix C

Table C-1 Measurement properties of the first-order factors (N = 200)

IT steering committee					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t value**	**P Level**
ITSTEER2	5.24	1.54	0.81	_	P < .001
ITSTEER3	5.55	1.33	0.79	13.98	P < .001
ITSTEER4	5.36	1.46	0.79	19.32	P < .001
ITSTEER5	5.51	1.34	0.77	16.68	P < .001
Refinement from initial model: ITSTEER1 deleted due to lack of item reliability					
Composite Reliability = 0.872, Average Variance Extracted = 0.630, Alpha de Cronbach = 0,872					
Involvement of senior management in IT					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
INVOLVE2	5.39	1.29	0.85	_	P < .001
INVOLVE3	5.28	1.34	0.80	16.80	P < .001
Refinement from initial model: INVOLVE1& INVOLVE4 deleted due to lack of items reliability					
Composite Reliability = 0.815, Average Variance Extracted = 0.688, Alpha de Cronbach = 0,814					
Corporate performance measurement system					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
CORPSYS1	5.53	1.24	0.80	_	P < .001
CORPSYS2	5.37	1.25	0.79	24.98	P < .001
CORPSYS3	5.57	1.18	0.73	17.76	P < .001
CORPSYS4	5.54	1.25	0.75	22.56	P < .001
COPSYS5	5.39	1.38	0.81	25.93	P < .001
Refinement from initial model: No items deleted					
Composite Reliability = 0.815, Average Variance Extracted = 0.688, Alpha de Cronbach = 0,884					

Corporate communication system					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
COMSYS1	5.53	1.26	0.82	_	P < .001
COMSYS2	5.42	1.22	0.85	29.27	P < .001
COMSYS3	5.48	1.33	0.84	32.68	P < .001
COMSYS4	5.61	1.34	0.78	17.19	P < .001
Refinement from initial model: No items deleted					
Composite Reliability = 0.896, Average Variance Extracted = 0.685, Alpha de Cronbach = 0,895					
Culture of compliance in IT					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
ITCOMPL1	5.64	1.10	0.76	_	P < .001
ITCOMPL3	5.61	1.13	0.80	23.98	P < .001
ITCOMPL4	5.64	1.19	0.82	24.35	P < .001
Refinement from initial model: ITCOMPL2 deleted due to lack of item reliability					
Composite Reliability = 0.840, Average Variance Extracted = 0.636, Alpha de Cronbach = 0,834					
IT Planning					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
ITPL2	5.66	1.15	0.86	_	P < .001
ITPL3	5.59	1.23	0.84	32.42	P < .001
Refinement from initial model: ITPL1& ITPL4 deleted due to lack of items reliability					
Composite Reliability = 0.841, Average Variance Extracted = 0.726, Alpha de Cronbach = 0,843					
IT Investment Decision-Making					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
ITIV1	5.82	1.17	0.80	_	P < .001
ITIV2	5.64	1.12	0.74	12.70	P < .001
ITIV5	5.53	1.19	0.66	10.55	P < .001
Refinement from initial model: ITIV3& ITIV4 deleted due to lack of items reliability					
Composite Reliability = 0.785, Average Variance Extracted = 0.550, Alpha de Cronbach = 0,773					

IT Coordination					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
ITCO1	5.52	1.31	0,79	_	P < .001
ITCO2	5.47	1.33	0.81	20.86	P < .001
ITCO3	5.35	1.39	0.84	29.24	P < .001
ITCO4	5.51	1.33	0.83	29.33	P < .001
Refinement from initial model: No items deleted					
Composite Reliability = 0.893, Average Variance Extracted = 0.678, Alpha de Cronbach = 0,893					
IT Control					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
ITCR1	5.54	1.32	0.81	_	P < .001
ITCR2	5.48	1.30	0.81	27.01	P < .001
ITCR3	5.80	1.05	0.73	14.91	P < .001
ITCR4	5.78	1.18	0.78	18.65	P < .001
Refinement from initial model: No items deleted					
Composite Reliability = 0.867, Average Variance Extracted = 0.620, Alpha de Cronbach = 0,868					
Strategic Alignment					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
STRATAL1	5.53	1.22	0.85	_	P < .001
STRATAL2	5.74	1.10	0.79	21.90	P < .001
STRATAL3	5,83	1,18	0.77	21.90	P < .001
STRATAL4	5.66	1.24	0.80	23.34	P < .001
STRATAL5	5,59	1.30	0.84	31.39	P < .001
Refinement from initial model: No items deleted					
Composite Reliability = 0.906, Average Variance Extracted = 0.659, Alpha de Cronbach = 0,907					
IT contribution to organizational performance					
Item	**Mean**	**S.D.**	**Standardized Loadings**	**t-value**	**P-Level**
ITCONTRP2*	5.74	1.11	0.70	_	P < .001

ITCONTRP3	5.91	0.92	0.81	22.26	P < .001
ITCONTRP4	5.74	1.10	0.74	14.07	P < .001
Refinement from initial model: ITCONTRP1 deleted due to lack of item reliability					
Composite Reliability = 0.753, Average Variance Extracted = 0.605, Alpha de Cronbach = 0,818 *item removed from the calculation of composite reliability					

Table C-2 Correlation matrix of the measures[*] (N=200)

	ITSTEER1	ITSTEER2	ITSTEER3	ITSTEER4	ITSTEER5	ITSTEER6	ITSTEER7	INVOLVE1
ITSTEER1	1.00000	0.43650	0.43079	0.33062	0.41771	0.32131	0.53820	0.34524
ITSTEER2	0.43650	1.00000	0.67641	0.64803	0.58659	0.38992	0.43200	0.36411
ITSTEER3	0.43079	0.67641	1.00000	0.59818	0.59125	0.44817	0.42598	0.36252
ITSTEER4	0.33062	0.64803	0.59818	1.00000	0.68264	0.50362	0.35503	0.32203
ITSTEER5	0.41771	0.58659	0.59125	0.68264	1.00000	0.48719	0.30268	0.30107
ITSTEER6	0.32131	0.38992	0.44817	0.50362	0.48719	1.00000	0.49782	0.37378
ITSTEER7	0.53820	0.43200	0.42598	0.35503	0.30268	0.49782	1.00000	0.44196
INVOLVE1	0.34524	0.36411	0.36252	0.32203	0.30107	0.37378	0.44196	1.00000
INVOLVE2	0.31272	0.47577	0.30919	0.36348	0.30272	0.29205	0.36952	0.54218
INVOLVE3	0.28334	0.36171	0.33379	0.41038	0.37510	0.33708	0.28374	0.50515
INVOLVE4	0.25086	0.41572	0.46711	0.40612	0.42781	0.31651	0.23591	0.44522
CORPSYS1	0.54062	0.50803	0.48434	0.44419	0.48932	0.32581	0.42923	0.38213
CORPSYS2	0.41268	0.55886	0.47889	0.41764	0.44129	0.44856	0.37907	0.45947
CORPSYS3	0.47173	0.42282	0.52502	0.41637	0.44582	0.35039	0.40265	0.44670
CORPSYS4	0.39346	0.51344	0.50045	0.47407	0.48779	0.36563	0.35573	0.39744
CORPSYS5	0.41464	0.52141	0.51305	0.45738	0.54692	0.35494	0.34325	0.42555
COMSYS1	0.35350	0.40447	0.36245	0.38760	0.30875	0.24726	0.32694	0.41308
COMSYS2	0.43531	0.46441	0.40875	0.34458	0.33509	0.27352	0.35543	0.43258
COMSYS3	0.47151	0.38166	0.36093	0.35546	0.37617	0.26488	0.34804	0.44364
COMSYS4	0.38588	0.41217	0.35839	0.44671	0.43746	0.38476	0.29791	0.42057

	INVOLVE2	INVOLVE3	INVOLVE4	CORPSYS1	CORPSYS2	CORPSYS3	CORPSYS4	CORPSYS5
ITSTEER1	0.31272	0.28334	0.25086	0.54062	0.41268	0.47173	0.39346	0.41464
ITSTEER2	0.47577	0.36171	0.41572	0.50803	0.55886	0.42282	0.51344	0.52141
ITSTEER3	0.30919	0.33379	0.46711	0.48434	0.47889	0.52502	0.50045	0.51305
ITSTEER4	0.36348	0.41038	0.40612	0.44419	0.41764	0.41637	0.47407	0.45738
ITSTEER5	0.30272	0.37510	0.42781	0.48932	0.44129	0.44582	0.48779	0.54692
ITSTEER6	0.29205	0.33708	0.31651	0.32581	0.44856	0.35039	0.36563	0.35494
ITSTEER7	0.36952	0.28374	0.23591	0.42923	0.37907	0.40265	0.35573	0.34325
INVOLVE1	0.54218	0.50515	0.44522	0.38213	0.45947	0.44670	0.39744	0.42555
INVOLVE2	1.00000	0.68695	0.44773	0.40450	0.51448	0.46838	0.46334	0.48219
INVOLVE3	0.68695	1.00000	0.50964	0.37289	0.46862	0.45518	0.48710	0.53582
INVOLVE4	0.44773	0.50964	1.00000	0.40149	0.33975	0.39147	0.38250	0.41728
CORPSYS1	0.40450	0.37289	0.40149	1.00000	0.65270	0.59050	0.52057	0.67078
CORPSYS2	0.51448	0.46862	0.33975	0.65270	1.00000	0.58965	0.55897	0.64776
CORPSYS3	0.46838	0.45518	0.39147	0.59050	0.58965	1.00000	0.55753	0.57425
CORPSYS4	0.46334	0.48710	0.38250	0.52057	0.55897	0.55753	1.00000	0.68649
CORPSYS5	0.48219	0.53582	0.41728	0.67078	0.64776	0.57425	0.68649	1.00000
COMSYS1	0.45820	0.41041	0.26610	0.44900	0.46736	0.41537	0.50124	0.48981
COMSYS2	0.48861	0.41295	0.28737	0.52556	0.54295	0.50053	0.52478	0.50260
COMSYS3	0.56785	0.49740	0.36000	0.53781	0.52905	0.52885	0.54826	0.58979
COMSYS4	0.55405	0.53149	0.39311	0.49577	0.51712	0.48180	0.50811	0.59227

	COMSYS1	COMSYS2	COMSYS3	COMSYS4	ITCOMPL1	ITCOMPL2	ITCOMPL3	ITCOMPL4
ITSTEER1	0.35350	0.43531	0.47151	0.38588	0.37641	0.19736	0.33094	0.36539
ITSTEER2	0.40447	0.46441	0.38166	0.41217	0.37451	0.44111	0.40409	0.39484
ITSTEER3	0.36245	0.40875	0.36093	0.35839	0.29102	0.46129	0.41301	0.40643
ITSTEER4	0.38760	0.34458	0.35546	0.44671	0.44203	0.44540	0.41339	0.32489
ITSTEER5	0.30875	0.33509	0.37617	0.43746	0.39174	0.50230	0.45421	0.33612
ITSTEER6	0.24726	0.27352	0.26488	0.38476	0.34735	0.32907	0.46951	0.39089
ITSTEER7	0.32694	0.35543	0.34804	0.29791	0.27178	0.11383	0.34666	0.34792
INVOLVE1	0.41308	0.43258	0.44364	0.42057	0.42462	0.39036	0.55425	0.44639
INVOLVE2	0.45820	0.48861	0.56785	0.55405	0.53404	0.35095	0.51858	0.50006
INVOLVE3	0.41041	0.41295	0.49740	0.53149	0.43286	0.38065	0.48717	0.43717
INVOLVE4	0.26610	0.28737	0.36000	0.39311	0.33807	0.48263	0.41683	0.33438
CORPSYS1	0.44900	0.52556	0.53781	0.49577	0.52812	0.37442	0.52572	0.50821
CORPSYS2	0.46736	0.54295	0.52905	0.51712	0.51019	0.39476	0.62923	0.61262
CORPSYS3	0.41537	0.50053	0.52885	0.48180	0.48720	0.40639	0.50568	0.46036
CORPSYS4	0.50124	0.52478	0.54826	0.50811	0.52164	0.47017	0.56551	0.53232
CORPSYS5	0.48981	0.50260	0.58979	0.59227	0.56631	0.39526	0.65952	0.67650
COMSYS1	1.00000	0.75538	0.67401	0.57149	0.52115	0.36794	0.48737	0.55470
COMSYS2	0.75538	1.00000	0.72381	0.62608	0.46141	0.36152	0.55286	0.57041
COMSYS3	0.67401	0.72381	1.00000	0.73010	0.58667	0.44583	0.57498	0.59653
COMSYS4	0.57149	0.62608	0.73010	1.00000	0.61408	0.34685	0.53481	0.59943

	ITPL1	ITPL2	ITPL3	ITPL4	ITIV1	ITIV2	ITIV3	ITIV4
ITSTEER1	0.31525	0.32724	0.37702	0.36957	0.31550	0.28218	0.33830	0.18767
ITSTEER2	0.27103	0.36760	0.34764	0.47331	0.30355	0.32177	0.44837	0.21429
ITSTEER3	0.24460	0.34232	0.29792	0.41533	0.37070	0.34817	0.41626	0.22250
ITSTEER4	0.29356	0.36581	0.32839	0.37686	0.36407	0.34581	0.33519	0.15665
ITSTEER5	0.28107	0.37456	0.33254	0.35602	0.35203	0.37070	0.45502	0.31413
ITSTEER6	0.34395	0.41203	0.31547	0.19532	0.34753	0.32699	0.28028	0.27277
ITSTEER7	0.25151	0.30993	0.34076	0.21961	0.29204	0.27606	0.35967	0.17681
INVOLVE1	0.31798	0.35258	0.34439	0.25083	0.27509	0.29653	0.39361	0.20355
INVOLVE2	0.43695	0.44582	0.54780	0.48949	0.41326	0.40030	0.45703	0.35195
INVOLVE3	0.47151	0.30440	0.34828	0.43687	0.35937	0.38211	0.39432	0.28120
INVOLVE4	0.28166	0.19892	0.18705	0.33631	0.25288	0.33471	0.35294	0.25444
CORPSYS1	0.45596	0.51554	0.44119	0.45623	0.42534	0.43580	0.43023	0.33489
CORPSYS2	0.45084	0.56005	0.48573	0.46761	0.48563	0.47606	0.48617	0.40631
CORPSYS3	0.30419	0.49433	0.51398	0.49782	0.43906	0.46247	0.39211	0.28353
CORPSYS4	0.40432	0.46044	0.50744	0.49072	0.40086	0.38364	0.50967	0.31916
CORPSYS5	0.40624	0.42739	0.46631	0.51320	0.44610	0.44315	0.48770	0.40862
COMSYS1	0.47195	0.48114	0.47740	0.43585	0.45295	0.39150	0.44275	0.37678
COMSYS2	0.48730	0.52458	0.49058	0.46755	0.48584	0.46368	0.43860	0.34384
COMSYS3	0.39780	0.49339	0.50691	0.45533	0.41945	0.39806	0.41467	0.40649
COMSYS4	0.43541	0.41838	0.48697	0.50224	0.50498	0.42702	0.34476	0.46202

	ITIV5	ITCO1	ITCO2	ITCO3	ITCO4	ITCR1	ITCR2	ITCR3
ITSTEER1	0.23453	0.37589	0.29303	0.28143	0.32506	0.28774	0.29935	0.27390
ITSTEER2	0.35640	0.32592	0.30859	0.39895	0.51124	0.41191	0.35597	0.26067
ITSTEER3	0.38643	0.28065	0.34612	0.37201	0.44931	0.34604	0.28096	0.20572
ITSTEER4	0.36078	0.33580	0.32805	0.45463	0.43375	0.40190	0.38266	0.30892
ITSTEER5	0.38889	0.29720	0.27404	0.42638	0.48174	0.40235	0.42575	0.31286
ITSTEER6	0.44552	0.32222	0.32984	0.32451	0.39324	0.42447	0.37587	0.35914
ITSTEER7	0.22596	0.24782	0.24131	0.26201	0.23315	0.28780	0.22080	0.17901
INVOLVE1	0.35826	0.29856	0.33551	0.32026	0.32870	0.30810	0.26410	0.28199
INVOLVE2	0.45836	0.51468	0.57150	0.53589	0.56811	0.53809	0.54809	0.49829
INVOLVE3	0.50528	0.47337	0.55084	0.53589	0.48284	0.43799	0.46324	0.42853
INVOLVE4	0.41947	0.32738	0.27217	0.35989	0.37092	0.23886	0.27830	0.16719
CORPSYS1	0.34012	0.46364	0.38853	0.48599	0.51465	0.42899	0.35927	0.40033
CORPSYS2	0.50067	0.43091	0.51783	0.49158	0.62304	0.57446	0.43094	0.48891
CORPSYS3	0.38605	0.38453	0.47375	0.49760	0.53880	0.44466	0.48941	0.39608
CORPSYS4	0.51038	0.41946	0.43597	0.50011	0.54594	0.47602	0.51498	0.46459
CORPSYS5	0.51499	0.54078	0.51392	0.59343	0.59532	0.52095	0.49153	0.49468
COMSYS1	0.45584	0.46994	0.41672	0.51708	0.45158	0.41467	0.43710	0.34227
COMSYS2	0.44608	0.38716	0.39839	0.40185	0.44640	0.36009	0.41638	0.37201
COMSYS3	0.42585	0.45419	0.45592	0.51847	0.47044	0.44776	0.49418	0.46581
COMSYS4	0.48677	0.45266	0.45756	0.49825	0.53606	0.51531	0.59741	0.47084

	ITCR4	STRATAL1	STRATAL2	STRATAL3	STRATAL4	STRATAL5	ITCONTR1	ITCONTR2
ITSTEER1	0.38182	0.36117	0.34366	0.32587	0.30304	0.33304	0.21419	0.33005
ITSTEER2	0.38404	0.36532	0.36583	0.39972	0.43968	0.39469	0.27147	0.29716
ITSTEER3	0.29556	0.32392	0.29439	0.30509	0.30795	0.31137	0.12089	0.22571
ITSTEER4	0.34377	0.28681	0.35468	0.32549	0.38002	0.41153	0.24774	0.19633
ITSTEER5	0.40620	0.34175	0.35716	0.35027	0.41602	0.43920	0.32651	0.26827
ITSTEER6	0.28306	0.36042	0.39017	0.39306	0.28439	0.35084	0.20853	0.25577
ITSTEER7	0.27495	0.24469	0.31385	0.29569	0.21708	0.22591	0.20432	0.25392
INVOLVE1	0.33154	0.34192	0.30090	0.27357	0.37890	0.27945	0.24339	0.23010
INVOLVE2	0.52235	0.53450	0.43963	0.41852	0.46581	0.49251	0.35845	0.36817
INVOLVE3	0.43994	0.45207	0.36635	0.36215	0.41378	0.44510	0.33075	0.20731
INVOLVE4	0.19943	0.31443	0.18947	0.22661	0.33354	0.33606	0.22138	0.20085
CORPSYS1	0.43960	0.50478	0.43855	0.41289	0.44509	0.47715	0.38690	0.36809
CORPSYS2	0.53659	0.54918	0.52980	0.45027	0.47357	0.52528	0.42957	0.39089
CORPSYS3	0.50176	0.50004	0.51605	0.53680	0.51226	0.53953	0.29292	0.36923
CORPSYS4	0.48993	0.45419	0.42071	0.45272	0.44887	0.42878	0.34439	0.33637
CORPSYS5	0.55121	0.53663	0.43509	0.45381	0.54181	0.56525	0.39767	0.40066
COMSYS1	0.37647	0.48226	0.43263	0.34673	0.36602	0.36726	0.34520	0.34191
COMSYS2	0.44559	0.42733	0.41500	0.38008	0.38373	0.39572	0.35207	0.39491
COMSYS3	0.47328	0.46051	0.39318	0.32176	0.37198	0.45445	0.31995	0.34409
COMSYS4	0.45342	0.47968	0.39760	0.42624	0.46524	0.55919	0.39778	0.34914

	ITCONTR3	ITCONTR4
ITSTEER1	0.30568	0.26408
ITSTEER2	0.32662	0.35111
ITSTEER3	0.26895	0.32757
ITSTEER4	0.26972	0.27040
ITSTEER5	0.29770	0.32266
ITSTEER6	0.29622	0.23448
ITSTEER7	0.25376	0.23331
INVOLVE1	0.22377	0.17733
INVOLVE2	0.27435	0.29865
INVOLVE3	0.18286	0.26078
INVOLVE4	0.19432	0.27097
CORPSYS1	0.40473	0.39460
CORPSYS2	0.38207	0.41394
CORPSYS3	0.35133	0.38536
CORPSYS4	0.32077	0.32234
CORPSYS5	0.35608	0.35933
COMSYS1	0.29105	0.36776
COMSYS2	0.40379	0.40725
COMSYS3	0.32305	0.35179
COMSYS4	0.38088	0.44154

	ITSTEER1	ITSTEER2	ITSTEER3	ITSTEER4	ITSTEER5	ITSTEER6	ITSTEER7	INVOLVE1
ITCOMPL1	0.37641	0.37451	0.29102	0.44203	0.39174	0.34735	0.27178	0.42462
ITCOMPL2	0.19736	0.44111	0.46129	0.44540	0.50230	0.32907	0.11383	0.39036
ITCOMPL3	0.33094	0.40409	0.41301	0.41339	0.45421	0.46951	0.34666	0.55425
ITCOMPL4	0.36539	0.39484	0.40643	0.32489	0.33612	0.39089	0.34792	0.44639
ITPL1	0.31525	0.27103	0.24460	0.29356	0.28107	0.34395	0.25151	0.31798
ITPL2	0.32724	0.36760	0.34232	0.36581	0.37456	0.41203	0.30993	0.35258
ITPL3	0.37702	0.34764	0.29792	0.32839	0.33254	0.31547	0.34076	0.34439
ITPL4	0.36957	0.47331	0.41533	0.37686	0.35602	0.19532	0.21961	0.25083
ITIV1	0.31550	0.30355	0.37070	0.36407	0.35203	0.34753	0.29204	0.27509
ITIV2	0.28218	0.32177	0.34817	0.34581	0.37070	0.32699	0.27606	0.29653
ITIV3	0.33830	0.44837	0.41626	0.33519	0.45502	0.28028	0.35967	0.39361
ITIV4	0.18767	0.21429	0.22250	0.15665	0.31413	0.27277	0.17681	0.20355
ITIV5	0.23453	0.35640	0.38643	0.36078	0.38889	0.44552	0.22596	0.35826
ITCO1	0.37589	0.32592	0.28065	0.33580	0.29720	0.32222	0.24782	0.29856
ITCO2	0.29303	0.30859	0.34612	0.32805	0.27404	0.32984	0.24131	0.33551
ITCO3	0.28143	0.39895	0.37201	0.45463	0.42638	0.32451	0.26201	0.32026
ITCO4	0.32506	0.51124	0.44931	0.43375	0.48174	0.39324	0.23315	0.32870
ITCR1	0.28774	0.41191	0.34604	0.40190	0.40235	0.42447	0.28780	0.30810
ITCR2	0.29935	0.35597	0.28096	0.38266	0.42575	0.37587	0.22080	0.26410
ITCR3	0.27390	0.26067	0.20572	0.30892	0.31286	0.35914	0.17901	0.28199

	INVOLVE2	INVOLVE3	INVOLVE4	CORPSYS1	CORPSYS2	CORPSYS3	CORPSYS4	CORPSYS5
ITCOMPL1	0.53404	0.43286	0.33807	0.52812	0.51019	0.48720	0.52164	0.56631
ITCOMPL2	0.35095	0.38065	0.48263	0.37442	0.39476	0.40639	0.47017	0.39526
ITCOMPL3	0.51858	0.48717	0.41683	0.52572	0.62923	0.50568	0.56551	0.65952
ITCOMPL4	0.50006	0.43717	0.33438	0.50821	0.61262	0.46036	0.53232	0.67650
ITPL1	0.43695	0.47151	0.28166	0.45596	0.45084	0.30419	0.40432	0.40624
ITPL2	0.44582	0.30440	0.19892	0.51554	0.56005	0.49433	0.46044	0.42739
ITPL3	0.54780	0.34828	0.18705	0.44119	0.48573	0.51398	0.50744	0.46631
ITPL4	0.48949	0.43687	0.33631	0.45623	0.46761	0.49782	0.49072	0.51320
ITIV1	0.41326	0.35937	0.25288	0.42534	0.48563	0.43906	0.40086	0.44610
ITIV2	0.40030	0.38211	0.33471	0.43580	0.47606	0.46247	0.38364	0.44315
ITIV3	0.45703	0.39432	0.35294	0.43023	0.48617	0.39211	0.50967	0.48770
ITIV4	0.35195	0.28120	0.25444	0.33489	0.40631	0.28353	0.31916	0.40862
ITIV5	0.45836	0.50528	0.41947	0.34012	0.50067	0.38605	0.51038	0.51499
ITCO1	0.51468	0.47337	0.32738	0.46364	0.43091	0.38453	0.41946	0.54078
ITCO2	0.57150	0.55084	0.27217	0.38853	0.51783	0.47375	0.43597	0.51392
ITCO3	0.53589	0.53589	0.35989	0.48599	0.49158	0.49760	0.50011	0.59343
ITCO4	0.56811	0.48284	0.37092	0.51465	0.62304	0.53880	0.54594	0.59532
ITCR1	0.53809	0.43799	0.23886	0.42899	0.57446	0.44466	0.47602	0.52095
ITCR2	0.54809	0.46324	0.27830	0.35927	0.43094	0.48941	0.51498	0.49153
ITCR3	0.49829	0.42853	0.16719	0.40033	0.48891	0.39608	0.46459	0.49468

	COMSYS1	COMSYS2	COMSYS3	COMSYS4	ITCOMPL1	ITCOMPL2	ITCOMPL3	ITCOMPL4
ITCOMPL1	0.52115	0.46141	0.58667	0.61408	1.00000	0.46122	0.60235	0.54576
ITCOMPL2	0.36794	0.36152	0.44583	0.34685	0.46122	1.00000	0.48433	0.38069
ITCOMPL3	0.48737	0.55286	0.57498	0.53481	0.60235	0.48433	1.00000	0.73159
ITCOMPL4	0.55470	0.57041	0.59653	0.59943	0.54576	0.38069	0.73159	1.00000
ITPL1	0.47195	0.48730	0.39780	0.43541	0.40932	0.30566	0.43142	0.43954
ITPL2	0.48114	0.52458	0.49339	0.41838	0.47239	0.34854	0.47074	0.43214
ITPL3	0.47740	0.49058	0.50691	0.48697	0.46747	0.30757	0.44252	0.47253
ITPL4	0.43585	0.46755	0.45533	0.50224	0.46757	0.36376	0.46498	0.53501
ITIV1	0.45295	0.48584	0.41945	0.50498	0.37916	0.20287	0.43502	0.49956
ITIV2	0.39150	0.46368	0.39806	0.42702	0.33733	0.27573	0.36608	0.37003
ITIV3	0.44275	0.43860	0.41467	0.34476	0.42215	0.35626	0.46587	0.40209
ITIV4	0.37678	0.34384	0.40649	0.46202	0.40161	0.24408	0.39832	0.41572
ITIV5	0.45584	0.44608	0.42585	0.48677	0.40750	0.35147	0.53813	0.52391
ITCO1	0.46994	0.38716	0.45419	0.45266	0.48984	0.26712	0.45046	0.45569
ITCO2	0.41672	0.39839	0.45592	0.45756	0.46358	0.34158	0.51098	0.51035
ITCO3	0.51708	0.40185	0.51847	0.49825	0.50646	0.36386	0.48800	0.50433
ITCO4	0.45158	0.44640	0.47044	0.53606	0.47341	0.38765	0.55116	0.54162
ITCR1	0.41467	0.36009	0.44776	0.51531	0.49074	0.28047	0.47540	0.50440
ITCR2	0.43710	0.41638	0.49418	0.59741	0.55530	0.32137	0.47647	0.46494
ITCR3	0.34227	0.37201	0.46581	0.47084	0.51265	0.36005	0.44669	0.50087

	ITPL1	ITPL2	ITPL3	ITPL4	ITIV1	ITIV2	ITIV3	ITIV4
ITCOMPL1	0.40932	0.47239	0.46747	0.46757	0.37916	0.33733	0.42215	0.40161
ITCOMPL2	0.30566	0.34854	0.30757	0.36376	0.20287	0.27573	0.35626	0.24408
ITCOMPL3	0.43142	0.47074	0.44252	0.46498	0.43502	0.36608	0.46587	0.39832
ITCOMPL4	0.43954	0.43214	0.47253	0.53501	0.49956	0.37003	0.40209	0.41572
ITPL1	1.00000	0.47171	0.47939	0.35492	0.40190	0.40418	0.39655	0.32679
ITPL2	0.47171	1.00000	0.72831	0.38023	0.53768	0.50124	0.39523	0.41282
ITPL3	0.47939	0.72831	1.00000	0.46400	0.48389	0.44363	0.46071	0.42663
ITPL4	0.35492	0.38023	0.46400	1.00000	0.57919	0.39447	0.40968	0.34582
ITIV1	0.40190	0.53768	0.48389	0.57919	1.00000	0.66964	0.41081	0.38353
ITIV2	0.40418	0.50124	0.44363	0.39447	0.66964	1.00000	0.46377	0.38165
ITIV3	0.39655	0.39523	0.46071	0.40968	0.41081	0.46377	1.00000	0.47239
ITIV4	0.32679	0.41282	0.42663	0.34582	0.38353	0.38165	0.47239	1.00000
ITIV5	0.38652	0.47664	0.44730	0.48406	0.49082	0.43289	0.50556	0.57738
ITCO1	0.50677	0.45860	0.50140	0.56763	0.43298	0.37493	0.43472	0.33286
ITCO2	0.52422	0.49311	0.56724	0.57193	0.48432	0.41467	0.43830	0.36280
ITCO3	0.42600	0.54959	0.53721	0.47589	0.50868	0.47200	0.50269	0.47930
ITCO4	0.40612	0.53781	0.57103	0.55062	0.51453	0.50791	0.53726	0.43279
ITCR1	0.46066	0.51855	0.57010	0.51213	0.55114	0.50162	0.51905	0.44448
ITCR2	0.38691	0.53869	0.62183	0.59499	0.55081	0.48018	0.45323	0.51275
ITCR3	0.45331	0.51713	0.59284	0.53066	0.48707	0.40835	0.38530	0.43217

	ITIV5	ITCO1	ITCO2	ITCO3	ITCO4	ITCR1	ITCR2	ITCR3
ITCOMPL1	0.40750	0.48984	0.46358	0.50646	0.47341	0.49074	0.55530	0.51265
ITCOMPL2	0.35147	0.26712	0.34158	0.36386	0.38765	0.28047	0.32137	0.36005
ITCOMPL3	0.53813	0.45046	0.51098	0.48800	0.55116	0.47540	0.47647	0.44669
ITCOMPL4	0.52391	0.45569	0.51035	0.50433	0.54162	0.50440	0.46494	0.50087
ITPL1	0.38652	0.50677	0.52422	0.42600	0.40612	0.46066	0.38691	0.45331
ITPL2	0.47664	0.45860	0.49311	0.54959	0.53781	0.51855	0.53869	0.51713
ITPL3	0.44730	0.50140	0.56724	0.53721	0.57103	0.57010	0.62183	0.59284
ITPL4	0.48406	0.56763	0.57193	0.47589	0.55062	0.51213	0.59499	0.53066
ITIV1	0.49082	0.43298	0.48432	0.50868	0.51453	0.55114	0.55081	0.48707
ITIV2	0.43289	0.37493	0.41467	0.47200	0.50791	0.50162	0.48018	0.40835
ITIV3	0.50556	0.43472	0.43830	0.50269	0.53726	0.51905	0.45323	0.38530
ITIV4	0.57738	0.33286	0.36280	0.47930	0.43279	0.44448	0.51275	0.43217
ITIV5	1.00000	0.43627	0.49428	0.53183	0.55979	0.48004	0.52344	0.46208
ITCO1	0.43627	1.00000	0.72905	0.64818	0.59920	0.55357	0.57653	0.48489
ITCO2	0.49428	0.72905	1.00000	0.68601	0.66137	0.60925	0.55329	0.55947
ITCO3	0.53183	0.64818	0.68601	1.00000	0.73769	0.62270	0.62102	0.48241
ITCO4	0.55979	0.59920	0.66137	0.73769	1.00000	0.72802	0.64876	0.47230
ITCR1	0.48004	0.55357	0.60925	0.62270	0.72802	1.00000	0.68246	0.58448
ITCR2	0.52344	0.57653	0.55329	0.62102	0.64876	0.68246	1.00000	0.60866
ITCR3	0.46208	0.48489	0.55947	0.48241	0.47230	0.58448	0.60866	1.00000

	ITCR4	STRATAL1	STRATAL2	STRATAL3	STRATAL4	STRATAL5	ITCONTR1	ITCONTR2
ITCOMPL1	0.52511	0.54794	0.45638	0.39160	0.40833	0.51298	0.40677	0.37718
ITCOMPL2	0.33853	0.31159	0.28775	0.21774	0.30100	0.32029	0.18865	0.16792
ITCOMPL3	0.49057	0.49107	0.41297	0.45079	0.43948	0.52529	0.32665	0.35557
ITCOMPL4	0.52417	0.49599	0.39034	0.42131	0.46451	0.53886	0.27120	0.37739
ITPL1	0.45165	0.49391	0.46223	0.37459	0.33569	0.35760	0.46665	0.39333
ITPL2	0.55997	0.55600	0.64376	0.50812	0.49602	0.48282	0.41255	0.51994
ITPL3	0.59965	0.50826	0.55949	0.53256	0.48139	0.51228	0.40895	0.49867
ITPL4	0.54932	0.49973	0.41131	0.45110	0.51152	0.57910	0.36112	0.35814
ITIV1	0.51891	0.52620	0.48136	0.48836	0.47737	0.54081	0.41826	0.47940
ITIV2	0.45742	0.50484	0.46649	0.47296	0.52867	0.50990	0.42842	0.38043
ITIV3	0.46911	0.54341	0.46958	0.41863	0.50633	0.45398	0.34816	0.39755
ITIV4	0.38887	0.46642	0.45726	0.35549	0.42591	0.47201	0.36924	0.29405
ITIV5	0.45218	0.51368	0.48095	0.48825	0.51230	0.53735	0.30801	0.30526
ITCO1	0.54347	0.67117	0.54348	0.52144	0.52007	0.62871	0.46646	0.38987
ITCO2	0.54071	0.62521	0.58733	0.54581	0.52319	0.65086	0.39963	0.35491
ITCO3	0.53227	0.69601	0.59361	0.54659	0.63873	0.68898	0.42479	0.41379
ITCO4	0.57487	0.70425	0.59101	0.64881	0.65832	0.70948	0.42533	0.44994
ITCR1	0.60925	0.66524	0.62822	0.58997	0.59004	0.69549	0.43532	0.46529
ITCR2	0.59535	0.65023	0.58720	0.61321	0.56983	0.63097	0.43303	0.46056
ITCR3	0.65656	0.49609	0.53346	0.45415	0.45215	0.51451	0.43766	0.48004

	ITCONTR3	ITCONTR4
ITCOMPL1	0.29792	0.27882
ITCOMPL2	0.15159	0.17308
ITCOMPL3	0.38554	0.29952
ITCOMPL4	0.42391	0.33989
ITPL1	0.30880	0.30490
ITPL2	0.52503	0.40367
ITPL3	0.39274	0.33443
ITPL4	0.33777	0.38262
ITIV1	0.51786	0.49697
ITIV2	0.40539	0.42572
ITIV3	0.20151	0.34838
ITIV4	0.25761	0.40785
ITIV5	0.40457	0.41228
ITCO1	0.29701	0.36682
ITCO2	0.28867	0.32505
ITCO3	0.40708	0.41238
ITCO4	0.44721	0.47947
ITCR1	0.40759	0.41232
ITCR2	0.39559	0.45578
ITCR3	0.39516	0.28709

	ITSTEER1	ITSTEER2	ITSTEER3	ITSTEER4	ITSTEER5	ITSTEER6	ITSTEER7	INVOLVE1
ITCR4	0.38182	0.38404	0.29556	0.34377	0.40620	0.28306	0.27495	0.33154
STRATAL1	0.36117	0.36532	0.32392	0.28681	0.34175	0.36042	0.24469	0.34192
STRATAL2	0.34366	0.36583	0.29439	0.35468	0.35716	0.39017	0.31385	0.30090
STRATAL3	0.32587	0.39972	0.30509	0.32549	0.35027	0.39306	0.29569	0.27357
STRATAL4	0.30304	0.43968	0.30795	0.38002	0.41602	0.28439	0.21708	0.37890
STRATAL5	0.33304	0.39469	0.31137	0.41153	0.43920	0.35084	0.22591	0.27945
ITCONTR1	0.21419	0.27147	0.12089	0.24774	0.32651	0.20853	0.20432	0.24339
ITCONTR2	0.33005	0.29716	0.22571	0.19633	0.26827	0.25577	0.25392	0.23010
ITCONTR3	0.30568	0.32662	0.26895	0.26972	0.29770	0.29622	0.25376	0.22377
ITCONTR4	0.26408	0.35111	0.32757	0.27040	0.32266	0.23448	0.23331	0.17733

	INVOLVE2	INVOLVE3	INVOLVE4	CORPSYS1	CORPSYS2	CORPSYS3	CORPSYS4	CORPSYS5
ITCR4	0.52235	0.43994	0.19943	0.43960	0.53659	0.50176	0.48993	0.55121
STRATAL1	0.53450	0.45207	0.31443	0.50478	0.54918	0.50004	0.45419	0.53663
STRATAL2	0.43963	0.36635	0.18947	0.43855	0.52980	0.51605	0.42071	0.43509
STRATAL3	0.41852	0.36215	0.22661	0.41289	0.45027	0.53680	0.45272	0.45381
STRATAL4	0.46581	0.41378	0.33354	0.44509	0.47357	0.51226	0.44887	0.54181
STRATAL5	0.49251	0.44510	0.33606	0.47715	0.52528	0.53953	0.42878	0.56525
ITCONTR1	0.35845	0.33075	0.22138	0.38690	0.42957	0.29292	0.34439	0.39767
ITCONTR2	0.36817	0.20731	0.20085	0.36809	0.39089	0.36923	0.33637	0.40066
ITCONTR3	0.27435	0.18286	0.19432	0.40473	0.38207	0.35133	0.32077	0.35608
ITCONTR4	0.29865	0.26078	0.27097	0.39460	0.41394	0.38536	0.32234	0.35933

	COMSYS1	COMSYS2	COMSYS3	COMSYS4	ITCOMPL1	ITCOMPL2	ITCOMPL3	ITCOMPL4
ITCR4	0.37647	0.44559	0.47328	0.45342	0.52511	0.33853	0.49057	0.52417
STRATAL1	0.48226	0.42733	0.46051	0.47968	0.54794	0.31159	0.49107	0.49599
STRATAL2	0.43263	0.41500	0.39318	0.39760	0.45638	0.28775	0.41297	0.39034
STRATAL3	0.34673	0.38008	0.32176	0.42624	0.39160	0.21774	0.45079	0.42131
STRATAL4	0.36602	0.38373	0.37198	0.46524	0.40833	0.30100	0.43948	0.46451
STRATAL5	0.36726	0.39572	0.45445	0.55919	0.51298	0.32029	0.52529	0.53886
ITCONTR1	0.34520	0.35207	0.31995	0.39778	0.40677	0.18865	0.32665	0.27120
ITCONTR2	0.34191	0.39491	0.34409	0.34914	0.37718	0.16792	0.35557	0.37739
ITCONTR3	0.29105	0.40379	0.32305	0.38088	0.29792	0.15159	0.38554	0.42391
ITCONTR4	0.36776	0.40725	0.35179	0.44154	0.27882	0.17308	0.29952	0.33989

	ITPL1	ITPL2	ITPL3	ITPL4	ITIV1	ITIV2	ITIV3	ITIV4
ITCR4	0.45165	0.55997	0.59965	0.54932	0.51891	0.45742	0.46911	0.38887
STRATAL1	0.49391	0.55600	0.50826	0.49973	0.52620	0.50484	0.54341	0.46642
STRATAL2	0.46223	0.64376	0.55949	0.41131	0.48136	0.46649	0.46958	0.45726
STRATAL3	0.37459	0.50812	0.53256	0.45110	0.48836	0.47296	0.41863	0.35549
STRATAL4	0.33569	0.49602	0.48139	0.51152	0.47737	0.52867	0.50633	0.42591
STRATAL5	0.35760	0.48282	0.51228	0.57910	0.54081	0.50990	0.45398	0.47201
ITCONTR1	0.46665	0.41255	0.40895	0.36112	0.41826	0.42842	0.34816	0.36924
ITCONTR2	0.39333	0.51994	0.49867	0.35814	0.47940	0.38043	0.39755	0.29405
ITCONTR3	0.30880	0.52503	0.39274	0.33777	0.51786	0.40539	0.20151	0.25761
ITCONTR4	0.30490	0.40367	0.33443	0.38262	0.49697	0.42572	0.34838	0.40785

	ITIV5	ITCO1	ITCO2	ITCO3	ITCO4	ITCR1	ITCR2	ITCR3
ITCR4	0.45218	0.54347	0.54071	0.53227	0.57487	0.60925	0.59535	0.65656
STRATAL1	0.51368	0.67117	0.62521	0.69601	0.70425	0.66524	0.65023	0.49609
STRATAL2	0.48095	0.54348	0.58733	0.59361	0.59101	0.62822	0.58720	0.53346
STRATAL3	0.48825	0.52144	0.54581	0.54659	0.64881	0.58997	0.61321	0.45415
STRATAL4	0.51230	0.52007	0.52319	0.63873	0.65832	0.59004	0.56983	0.45215
STRATAL5	0.53735	0.62871	0.65086	0.68898	0.70948	0.69549	0.63097	0.51451
ITCONTR1	0.30801	0.46646	0.39963	0.42479	0.42533	0.43532	0.43303	0.43766
ITCONTR2	0.30526	0.38987	0.35491	0.41379	0.44994	0.46529	0.46056	0.48004
ITCONTR3	0.40457	0.29701	0.28867	0.40708	0.44721	0.40759	0.39559	0.39516
ITCONTR4	0.41228	0.36682	0.32505	0.41238	0.47947	0.41232	0.45578	0.28709

	ITCR4	STRATAL1	STRATAL2	STRATAL3	STRATAL4	STRATAL5	ITCONTR1	ITCONTR2
ITCR4	1.00000	0.58187	0.54514	0.60051	0.60382	0.57181	0.48251	0.56200
STRATAL1	0.58187	1.00000	0.75205	0.60990	0.65616	0.67710	0.48692	0.48442
STRATAL2	0.54514	0.75205	1.00000	0.64173	0.58160	0.63149	0.45116	0.45112
STRATAL3	0.60051	0.60990	0.64173	1.00000	0.63408	0.65185	0.40820	0.50194
STRATAL4	0.60382	0.65616	0.58160	0.63408	1.00000	0.77286	0.36154	0.45976
STRATAL5	0.57181	0.67710	0.63149	0.65185	0.77286	1.00000	0.47612	0.39994
ITCONTR1	0.48251	0.48692	0.45116	0.40820	0.36154	0.47612	1.00000	0.53721
ITCONTR2	0.56200	0.48442	0.45112	0.50194	0.45976	0.39994	0.53721	1.00000
ITCONTR3	0.44826	0.41588	0.43936	0.49770	0.44673	0.46901	0.45381	0.59941
ITCONTR4	0.39519	0.49785	0.50198	0.51973	0.46545	0.49270	0.51678	0.49585

	ITCONTR3	ITCONTR4
ITCR4	0.44826	0.39519
STRATAL1	0.41588	0.49785
STRATAL2	0.43936	0.50198
STRATAL3	0.49770	0.51973
STRATAL4	0.44673	0.46545
STRATAL5	0.46901	0.49270
ITCONTR1	0.45381	0.51678
ITCONTR2	0.59941	0.49585
ITCONTR3	1.00000	0.60186
ITCONTR4	0.60186	1.00000

* Pearson correlation is significant at the 0.0001 level (2-tailed)

Appendix D

Table D-1 Fit indices for estimated models

Indices	Recommendation	Measurement model outcomes	SEM outcomes
Normed X^2	< 3.0	1.478	1.482
CFI	> 0.90	0.929	0.924
TLI	> 0.90	0.919	0.918
SRMR	< 0.08	0.052	0.057
RMSEA	< 0.08	0.049	0.049

Appendix E - Questionnaire

Study on IT Governance:

Impact of IT Governance on organizational performance

Research project for a Doctoral thesis

Dear CIO or senior IT executive,

My name is Saida Harguem M.B.A., and I am a doctoral candidate at *Laval University*. You will find in the following pages a confidential questionnaire, which I invite you to complete. This questionnaire was developed as part of my doctoral dissertation.

The main objective of this study is to increase our understanding of the use of IT Governance mechanisms within organizations and their impact on organizational performance. Your support and contribution to this study are greatly appreciated. On your request, **we will send you the final results of this study.**

Confidentiality

Your participation in this research is voluntary and completely anonymous. In addition, please note that you may stop completing the questionnaire at any time, which would prohibit us from using the information gathered. The information collected will remain strictly confidential and will only be used for completing a doctoral thesis and for future scientific articles. The collected data will be published anonymously and only in aggregate and statistical form.

Instructions to respondents

1. This questionnaire should preferably be filled out by the **IT department head (CIO), vice-president of IT or another senior IT executive** in the organization.

2. Please respond to the following questions based on your first impressions. There are no right or wrong answers. Please answer each question to the best of your ability. This survey should take approximately 15 minutes to complete.

3. If you have any questions or comments, please e-mail Saida Harguem (saida.harguem.1@ulaval.ca) for a prompt and personal response.

Thank you in advance for your precious support and collaboration.

[2] This research was approved by the ethics committee at Laval University on January 29th, 2013 under no 2012-282 / 29-01-2013.

Section 1 - IT Governance mechanisms

In this section, we want to measure the level of development of the following **IT Governance mechanisms** in your organization.

1. IT steering committee related IT governance

Indicate the extent to which you agree or disagree with the following in relation to your organization's IT steering committee

	Strongly Disagree						**Strongly Agree**	**N /A**
								N/A
In our organization, the IT steering committee is charged with steering IT activities that are in line with the strategic direction of the organization.	1	2	3	4	5	6	7	
The IT steering committee is appointed to take control of the technology from IT specialists.	1	2	3	4	5	6	7	N/A
The IT steering committee decides on the resource allocation in the areas of system development and/or recruitment for the IT function.	1	2	3	4	5	6	7	N/A
The IT steering committee is created to increase visibility and/or to revamp IT.	1	2	3	4	5	6	7	N/A
The IT steering committee provides a mechanism for keeping and sustaining necessary reserved powers centrally.	1	2	3	4	5	6	7	N/A
The IT steering committee provides a mechanism for IT coordinating requirements and practices.	1	2	3	4	5	6	7	N/A

The IT steering committee is formed to solicit the support of top management for IT activities.	1	2	3	4	5	6	7	N/A

Involvement of senior management in IT

	Not At all						**To a great Extent**	**N /A**
To what extent does senior management get involved in strategic matters related to the use of IT within the organization, outside of the IT steering committee?	1	2	3	4	5	6	7	N/A
To what extent is senior management knowledgeable about IT opportunities and possibilities for the organization?	1	2	3	4	5	6	7	N/A
To what extent is senior management knowledgeable about IT innovations that have been developed by major competitors?	1	2	3	4	5	6	7	N/A
To what extent does senior management often endorse major IT investments that have not been endorsed by traditional justification criteria and procedures (such as the IT steering committee)?	1	2	3	4	5	6	7	N/A

2. Corporate performance measurement system

	Not At all						To a great Extent	N /A
To what extent does your organization's corporate performance measurement system measure the degree to which the organization's IT strategy supports the business strategy?	1	2	3	4	5	6	7	N/A
To what extent does your organization's corporate performance measurement system produce a concise model to assist managers in tracking the organization's progress?	1	2	3	4	5	6	7	N/A
To what extent does your organization's corporate performance measurement system provide management with control measures on IT expenses?	1	2	3	4	5	6	7	N/A
To what extent does your organization's corporate performance measurement system provide management with control measures on the efficiency of IT development and operations?	1	2	3	4	5	6	7	N/A
To what extent does your organization's corporate performance measurement system allow for control measures to be compared with benchmarking figures for IT throughout the business operations?	1	2	3	4	5	6	7	N/A

3. Corporate communication systems

	Strongly Disagree						Strongly Agree	N /A
								N/A
My organization's communication systems enable the organization to inform its employees effectively about the existence of IT governance mechanisms.	1	2	3	4	5	6	7	
My organization's communication systems enable the organization to inform its employees about IT governance decisions and processes throughout the organization.	1	2	3	4	5	6	7	N/A
My organization's communication systems provide support in educating the organization's members on IT governance processes in the organization.	1	2	3	4	5	6	7	N/A
My organization's communication systems disseminate IT governance principles, policies, and outcomes of IT decision making processes throughout the organization.	1	2	3	4	5	6	7	N/A

4. Compliance program/activities in IT

	Not At all					To a great Extent		N /A
To what extent does your organization's compliance program/activities enable the organization to achieve its IT objectives?	1	2	3	4	5	6	7	N/A
To what extent does your organization's compliance program/activities enable the circumvention of any violation that could hinder the organization to achieve its IT objectives?	1	2	3	4	5	6	7	N/A
To what extent does top management provide leadership in compliance program/activities related to IT objectives?	1	2	3	4	5	6	7	N/A
To what extent does your organization's compliance program/activities enhance IT controls' design, documentation, and consistency?	1	2	3	4	5	6	7	N/A

Section 2 - IT management

In this section, we want to measure various dimensions of your organization's ***IT management*** **capabilities**. Indicate the extent to which you agree or disagree with the following in relation to your organization's IT management capabilities?

	Strongly Disagree						**Strongly Agree**	**N /A**
We continuously examine the innovative opportunities for the strategic use of IT.	1	2	3	4	5	6	7	N/A
We enforce adequate plans for the introduction and utilization of IT.	1	2	3	4	5	6	7	N/A
We perform IT planning processes in systematic and formalized ways.	1	2	3	4	5	6	7	N/A
We frequently adjust IT plans to better adapt to changing conditions.	1	2	3	4	5	6	7	N/A
When we make IT investment decisions, we think about and estimate the effect they will have on the quality and productivity of the employees' work.	1	2	3	4	5	6	7	N/A
When we make IT investment decisions, we consider and project how much these options will help end users make quicker decisions.	1	2	3	4	5	6	7	N/A
When we make IT investment decisions, we consider and estimate whether they will consolidate or eliminate jobs.	1	2	3	4	5	6	7	N/A
When we make IT investment decisions, we think about and estimate the amount and cost of training that end users will need.	1	2	3	4	5	6	7	N/A
When we make IT investment decisions, we consider and estimate the time managers will need to spend overseeing the change.	1	2	3	4	5	6	7	N/A
In our organization, IS and line people meet frequently to	1	2	3	4	5	6	7	N/A

	Strongly Disagree						Strongly Agree	N /A
discuss important issues both formally and informally.								
In our organization, IS people and line people from various departments frequently attend cross-functional meetings.	1	2	3	4	5	6	7	N/A
In our organization, IS and line people coordinate their efforts harmoniously.	1	2	3	4	5	6	7	N/A
In our organization, information is widely shared between IS and line people so that those who make decisions or perform jobs have access to all available know-how.	1	2	3	4	5	6	7	N/A
In our organization, the responsibility and authority for IT direction and development are clear.	1	2	3	4	5	6	7	N/A
We are confident that IT project proposals are properly appraised.	1	2	3	4	5	6	7	N/A
We constantly monitor the performance of IT function.	1	2	3	4	5	6	7	N/A
Our IT department is clear about its performance criteria.	1	2	3	4	5	6	7	N/A

Section 3 - IT strategic alignment

To what extent do you agree with the following statements?

	Strongly Disagree						Strongly Agree	N /A
The co-operation between the IT and business functions works well.	1	2	3	4	5	6	7	N/A
The IT strategy is congruent with the corporate business strategy in our organization.	1	2	3	4	5	6	7	N/A
Decisions in IT planning are tightly linked to the organization's strategic plan.	1	2	3	4	5	6	7	N/A

Our IT management participates actively in business planning.	1	2	3	4	5	6	7	N/A
Our business strategy and IT strategy are closely aligned.	1	2	3	4	5	6	7	N/A

Section 4 – Contribution of IT to Organizational Performance

Please assess the extent to which IT has contributed to each of the following areas of organizational performance:

	Not at all						**To a great extent**	**N /A**
Customer satisfaction.	1	2	3	4	5	6	7	N/A
Process improvement.	1	2	3	4	5	6	7	N/A
Operating efficiency.	1	2	3	4	5	6	7	N/A
Cost savings.	1	2	3	4	5	6	7	N/A

Section 6 - General Information

1) IT function Background (please approximate when necessary)

a. What is your current job title?

_____

b. How many full-time employees work in your corporate IT department?

_____

c. How many major subunits/groups (e.g. help desk, development) does your IT department have?

---

d. How many PC's are there in your company that your IT department supports?

---

e. What is the ratio of your IT budget to total company budget?

---

2) Company Background (please approximate when necessary)

a. What is the primary industry of your company?

- ☐ Finance/Banking/Insurance
- ☐ Chartered Firm/Management Consulting
- ☐ Education
- ☐ Energy/Mining
- ☐ Food/Household
- ☐ Transportation/logistics
- ☐ TV/News/Publishing
- ☐ Tourism & Leisure
- ☐ Other (Please specify):

  _____

- ☐ Government Agencies
- ☐ Health Care/Biotechnology
- ☐ IT consulting Services
- ☐ Manufacturing & processing
- ☐ Wholesale/Retail
- ☐ Transportation/Logistics
- ☐ Tourism & Leisure
- ☐ Communication/Utilities

b. Approximately how many employees does your organization have?

---

c. How many major business units does your company have?

---

d. What are the approximate annual sales of your company?

- ☐ Less than $100 million
- ☐ $101 - $300 million
- ☐ $301 - $1000 million
- ☐ $1001 - $3000 million
- ☐ More than $3000 million
- ☐ I don't know

3) Demographics and other information

a. For how many years have you been managing IT? _____.

b. What is your geographic location?
City / Town: _____

State / Province: _____

Country: _____

c. Please check the highest educational degree that you have obtained?

- ☐ Post Graduate Diploma (Ph.D.)
- ☐ Master's degree/MBA
- ☐ University Bachelor's degree
- ☐ High school diploma
- ☐ Post-graduate certificate/diploma
- ☐ Community College/CEGEP
- ☐ Other (Please specify): _____

d. How old are you? _____

e. What is your gender:
☐ Female ☐ Male

In appreciation of your valuable participation we would be happy to provide you with the final results of this research. Once you have completed the questionnaire would you like to receive the final results of this research?

☐ Yes ☐ No

If you answered YES to the question above, please write your email address here [1]:

_____

[1] Even if you provide your email address, your personal information will never be released in any report. In addition, please note that we will not link your personal information to the data collected in this questionnaire. Your email address will only be used to send you the final results of this research.

Thank you for your precious time and support!

Chapitre IV – Article 3

EXAMINING THE INFLUENCE OF EXTERNAL STAKEHOLDERS ON IT GOVERNANCE: PERCEPTIONS OF IT EXECUTIVES

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ABSTRACT

Information Technology (IT) governance decisions usually involve several stakeholders with divergent claims. Past research on IT governance focused on internal stakeholders' responsibilities and roles in IT governance decisions. However, we don't know much about external stakeholders' place in IT governance. Based on stakeholder theory, a qualitative research approach is adopted to determine the importance given to different external stakeholders in IT governance by examining how they are prioritized in this context. Results suggested that external stakeholders' prioritization in IT governance context as perceived by IT executives vary according to IT decision domains. Moreover external stakeholders' influence over IT decision domains may be direct or indirect depending on their active role in IT activities or on their relationship with the organization as a whole. Implications of results are discussed.

Keywords: Stakeholder theory, IT governance, external stakeholders' salience, IT decision domains

INTRODUCTION

IT governance decisions usually involve several stakeholders with divergent claims. Stakeholders in IT governance context are groups who have either a responsibility for or an expectation from the enterprise's IT (e.g. shareholders, directors, business and technology management, users, employees, government, suppliers, customers and the public) (IT Governance Institute, 2003). Past research on IT governance focuses on internal stakeholders' responsibilities over IT decisions domains. However, to our knowledge, the place of external stakeholders in IT governance has not been considered in past research. In this study, external stakeholders are understood as social groups in the environment that have interests with the organization and can influence the way enterprises invest and use information technologies (Hovelja, Vasilecas, & Rupnik, 2013). Based on IS research and management literature, a list of principal external stakeholders is selected. Using this list as a baseline, a qualitative research approach is undertaken to determine what external stakeholders are considered important in the context of IT governance and examine how they are prioritized in the governance of IT decision domains.

This work seeks to contribute to the development of a stakeholder orientation in IT governance research. The study is based on the theory of stakeholder identification and salience (Mitchell, Agle, & Wood, 1997). According to this theory, power, legitimacy and urgency are the three attributes that qualify a stakeholder and determine its salience (the degree to which claims of competing stakeholders are given priority). The level of stakeholder's salience constitutes an indicator of its importance compared to other stakeholders (Jawahar & McLaughlin, 2001). In order to examine the importance given to external stakeholders in IT governance context, a qualitative research approach is undertaken to empirically determine different external stakeholders' groups' salience based on IT executives prioritization of their claims in IT.

This paper is structured as follows: First, a literature review is made on stakeholder theory including a description of the salience model of Mitchell et al. (1997). Then a review of the use of stakeholder concept in IT governance research is made. The next section presents the research questions and propositions. Thereafter, the paper presents the research methodology and empirical data from a qualitative survey. Based on the result analysis, the

authors illustrate the lessons learned, point out the implications to theory and practice along with a notification of limits of the present study to be addressed in future research.

THEORETICAL BACKGROUND

Stakeholder Theory

The concept of *stakeholder* popularized by Freeman (1984) is at the heart of stakeholder theory. Stakeholders represent "*any group or individual who can affect or is affected by the achievement of the organization's objectives*" (Freeman, 1984).

The contribution of stakeholder theory to management research was made from three separate perspectives but supporting each other, namely: descriptive, instrumental and normative perspectives (Donaldson & Preston, 1995). In the *normative perspective* also called the ethical one, the social performance of organizations is central (Carroll & Nasi, 1997; Clarkson, 1995; Wood & Jones, 1995). In this perspective, there was a strong link between corporate governance and corporate social responsibility. According to this perspective, organizations have a moral obligation to respect the interests of all stakeholders and not only those of their shareholders (Evan & Freeman, 1988). It is argued that organizations, need to recognize the interest of all stakeholders and address them through appropriate strategies (Christopher, 2010). The *instrumental* perspective focuses on the sound management of stakeholders on the basis of their analysis through tools and techniques for strategic decision support (Mason & Mitroff, 1981; Mitroff & Linstone, 1993). In this context, research aims to assess the effectiveness of these methods of stakeholders' analysis in order to improve corporate performance goals (Agle, Mitchell, & Sonnenfeld, 1999; Berman, Wicks, Kotha, & Jones, 1999; Jones, 1995). The *descriptive* perspective reports meanwhile relations between the organization and its environment. From this perspective, the organization is perceived as a constellation of cooperative and competitive interests having intrinsic value (Donaldson & Preston, 1995). This perspective is based on theoretical models such as the model of Mitchell et al. (1997) to analyze the relationship of the organization with its stakeholders in order to manage them better. A central issue in stakeholders' management is their identification and

prioritization (Carroll & Buchholtz, 1996; Clarkson, 1995; Donaldson & Preston, 1995; Freeman, 1984).

Stakeholder identification and salience: The Mitchell model

Stakeholder management implies to know "*who (or what) are the stakeholders of the firms? And to whom (or what) do managers pay attention*" (Mitchell et al. 1997). To answer this question, Mitchell et al. (1997) developed a descriptive theory of stakeholders widely cited in the literature, and which is today a reference in stakeholders management research (Caby & Harvey, 2001; Neville, Bell & Whitwell, 2011 ; Parent & Deephouse, 2007). To assess the importance of stakeholders, the authors propose a theoretical model based on the concept of salience. *Saliency* is defined as: "*The degree to which managers give priority to competing stakeholder claims*" (Mitchell et al., 1997). Stakeholder *salience* depends on three attributes: power, legitimacy and urgency. Power is "*the (potential) ability of stakeholders to impose their will on a given relationship through coercive, utilitarian, or normative means*" (Etzioni, 1964). A legitimate stakeholder is "*one whose actions and claims are seen as appropriate, proper and desirable within some socially constructed system of norms, values, beliefs*" (Suchman, 1995). Urgency is "*the degree to which stakeholder claims call for immediate attention*" (Mitchell et al. 1997). These three attributes depend on the perception of the manager inside the firm (Mitchell et al. 1997). A typology of stakeholders was developed based on this theory. This typology states that the more attributes a stakeholder had, the greater its salience would be (Parent & Deephouse, 2007). Based on Mitchell et al.'s model, stakeholders with no power, legitimacy, or urgency are perceived as having no salience with the firm's managers. In other situations, stakeholders may be considered as salient depending on whether they possess power, legitimacy, and urgency, two of these attributes or one of them. Thus, power, legitimacy and urgency are the three attributes that qualify a stakeholder and determine its salience according to this theory. Thereafter, the strategy a company uses to deal with a stakeholder is determined by the importance of that stakeholder compared to other stakeholders (Jawahar & McLaughlin, 2001) based on its salience. Although this conceptualization of *salience* is generally well accepted, Neville et

al. (2011) underline that these attributes are not dichotomous but rather continuous variables. Most empirical research used the Mitchell et al. (1997) framework as a tool for describing stakeholders' salience by using either qualitative or quantitative research methods (Parent & Deephouse, 2007). For instance, archival material (Driscoll & Starik, 2004; Friedman & Mason, 2004; Jeurissen, 2004; Ryan & Schneider, 2003) interviews (Harvey & Schaefer, 2001; Howard, Vidgen, & Powell, 2003 ; IJzerman, Reuzel, & Severens, 2003; Winn & Keller, 2001) and quantitative surveys (Agle, Mitchell & Sonnenfeld, 1999; Buanes, Jentoft, Runar Karlsen, Guerci & Shani, 2013; Maurstad, & Soreng, 2004) were used in past research to examine stakeholders' salience and relationships management in different organizational contexts.

Use of stakeholder concept in IT Governance

IT governance is recognised as an integral part of enterprise governance. It occurs via the distribution of IT decision-making rights and responsibilities among different stakeholders in the enterprise, and the definition of the procedures and mechanisms for making and monitoring strategic IT decisions (Peterson, 2004).

As stated by Peterson (2004) there is a clear distinction between IT management and IT governance. Using their words: “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 the present and future demands of the business (internal focus) and business customers (external focus)”. As such, IT governance may involve different stakeholders from inside and outside the organisation.

In describing how IT governance is deployed in organizations, various researchers focused in identifying key IT decision domains, and determining their governance modes, by specifying the decisions rights and responsibilities of organizational stakeholders over IT activities (Brown & Magill, 1994; Brown, 1997; Ein-Dor and Segev, 1982; Olson and Chervany, 1980; Sambamurthy & Zmud, 1999; Weill & Ross, 2004). Thus, several classifications of IT decision domains were presented in the literature and with it the distribution of decision-making between key stakeholders (Ahituv, Neumann, & Zviran, 1989; Brown & Magill, 1994; Ein-Dor & Segev, 1982; Olson & Chervany,

1980; Sambamurthy & Zmud, 1999; Tavakolian, 1989). These show the evolution of the IT function and its governance through the years. Table 1 presents a summary of key research in this area.

At the end of the 1960s the centralization of decision-making at a central IS organizational unit is a dominant practice in organizations (Olson & Chervany, 1980). Subsequently, several organizations have begun to experiment new forms of IT organization through a decentralization of control over certain IT activities across business units (Tavakolian, 1989).

With a general understanding of the virtues of each of the centralized and decentralized governance forms, research began to examine a new dilemma facing IT management: "*how to deal with the paradox of bi-polar governance systems within the same organization?*" (Brown & Grant, 2005). Firms wanted the best of both worlds: providing centralized management and coordination; and simultaneously providing discretionary input by managers through the firm into IT decisions (Boynton & Zmud, 1987).The federal form of governance has emerged as a result. It declines a hybrid approach that inherits the best of both worlds, a centralization of the main principles of IT at a central IT unit and a more decentralized participation of decision-making on IT activities through the organisation via the various business units (Boynton & Zmud, 1987).

According to Brown & Grant (2005), researchers began to find synergies between IT governance forms and the various types of IT decisions. This new type of research focused on examining the impact of IT governance modes on specific IT decision domains rather than on the IS organization as a whole (Sambamurthy and Zmud, 1999; Weill and Ross, 2004, 2005). Among these designs, we mention that of Sambamurthy and Zmud (1999). Widely cited in the literature, their governance framework includes three major decision domains: IT infrastructure management, IT use management and IT project management. Decision-making on these spheres of activities is shared between corporate IS, divisional IS and line management. Subsequently, a new representation of governance modes for the IT function has been proposed by Weill and Ross (2004; 2005). They presented six archetypal approaches to IT decision- making, ranging from highly centralized to highly decentralized. As mentioned by the authors, most organizations

employ a variety of them. Through these governance forms, IT decision-making can be at the hand of senior business executive or a group of senior executives (*business monarchy*), individual IT executive or a group of IT executives (*IT monarchy*), C-level executives and business representatives of all the operating groups (*federal system*), a two-party decision-making approach involving IT executives and a group of business leaders representing the operating units (*IT duopoly*), business unit or process leaders (*feudal system*), or even each individual user or small groups pursuing his, or their own IT agenda (*anarchy*). More recently, Grover, Henry and Thatcher (2007) added IT outsourcing to the IT decision domains and IT vendors as part of IT governance stakeholders along with IT management, top management, business units managers and IT divisional units.

Article 3 - Table 1. Principle Stakeholders Roles and Responsibilities in IT Governance Past Research

Authors	ITG related activity/decision	Stakeholders identified
Sambamurthy and Zmud (1999); Brown (1999)	- IT infrastructure management - IT use management - IT project management <u>Governance modes</u>: Centralized, Decentralized, Federal	• Corporate IS management Unit, Divisional IS, Line management.
(Weill & Ross, 2004); (Weill & Ross, 2005)	- IT principles (strategic vision) - IT architecture - IT infrastructure strategies - Business application needs - IT investment <u>Governance modes</u>: - Business monarchy, IT monarchy, Feudal, Federal, Duopoly, Anarchy	• Top-managers, IT specialists, Business Units, Combination of Corporate center and Business units, IT group and Business group, Isolated individual or small group decision making.
Grover, Henry, and Thatcher (2007)	- IT strategic vision	• Top management, IT management, Business units managers, IT

Authors	ITG related activity/decision	Stakeholders identified
	- IT architecture - IT investment - IT infrastructure - Application development - IT outsourcing <u>Governance modes</u>: - Federal (Hybrid with different configurations)	managers, IT vendors units
IT Governance Institute (2003; 2005 ; 2011)	- Present a holistic view of IT Governance	• Board of directors, External Auditors, Internal Auditors, Senior management team (IT governance council), IOC, Account executives (customer service representatives, business analysts), Project office, Project managers, User program managers, User area prioritization Teams (collaborate with IT vendors)
Peterson (2004)	- Present a holistic view of IT Governance	• Corporate executives, IT executives (CIO, etc.), Business executives, IT management, (divisional) business executives, IT consultants, IT vendors (external IT managers) (divisional), IT relationship managers

Recent research with a normative scope has proposed frameworks and guidelines as best practices for implementing effective IT governance. Among the recommendations proposed we cite: involvement of top management in IT strategy formulation and IT governance as a whole (IT Governance institute, 2011, Ali, Green & Robb, 2012), participation of the board of directors in IT governance (IT Governance Institute, 2003; Jewer & Mckay, 2012, Kuruzovich, Basselier & Sambamurthy, 2012), the ability to work well with outside parties (external business partners, service providers, IT vendors) (IT-Governance- institute, 2005, 2011), adherence to laws and specific regulations (Li & al., 2012; 2007), a deep analysis and management of stakeholders in IT governance according to their role (Messabia &

Elbakkali, 2010). The majority of these studies expose the benefits of these new practices in IT governance, such as better strategic alignment and greater IT business value.

As we see research on IT governance has mainly an internal focus to the organization as illustrated through the different archetypal forms of IT governance mentioned in the literature and broadly on how IT governance is deployed. This being said, there are other studies that have addressed the governance of interorganizational relationships involving IT such as IT outsourcing relationships (Aubert, Rivard, & Patry, 2004; Beulen, Ribbers, & Roos, 2010) or other forms of inter-organizational governance of IT (Croteau, Bergeron, & Dubsky, 2013; Markus & Bui, 2012). In our opinion, these researches cover the governance of transactions that any organization can have with its business partners. At the base, IT governance remains an integral part of enterprise or corporate governance. It falls under the responsibility of board members and executive management, and governance-related roles and activities need to be carried out by executives, managers and staff in almost every function and business unit across the enterprise (IT Governance Institute, 2008, p.13). As such, the decision to outsource partially or totally a given IT activity of the organization, for example, remains a corporate IT governance decision and thereby how to deal with IT outsourcing decisions would be arm-length IT governance, that is, governance of transactions. However, the organization does not evolve in a vacuum but is influenced by its environment so it's important to examine the potential impact of environmental forces, namely external stakeholders on IT governance. Indeed, the *IT Governance Institute* notes that, to be effective, IT governance has to consider external stakeholders' claims in a comprehensive IT governance framework (IT Governance Institute, 2011). To our knowledge, no research has empirically examined the importance given to external stakeholders in IT governance context.

RESEARCH QUESTION

In this study, the theory of stakeholder identification and salience (Mitchell, Agle, & Wood, 1997) is used as theoretical lenses and adapted to IT governance domain in order to respond to the following research questions:

What external stakeholder groups are perceived as most important in IT governance context? How are they prioritized in this context?

External stakeholders are understood as social groups in the environment that have interests with the organization and can influence the way enterprises invest and use information technologies (Hovelja et al., 2013). A list of principal external stakeholders were identified from IS research (Grover, Henry et al. 2007; IT Governance institute, 2003; 2005; 2011; Peterson, 2004; Rau, 2004; Weill & Ross, 2005) and management literature (Agle et al. 1999; Argandoña 1998; Berman, Wicks et al. 1999; Donaldson & Preston 1995). This list constitutes a baseline in the investigation of the research questions. It reports the following parties: IT suppliers, IT consultants, compliance, external audit & security groups, business customers, business suppliers, investors, shareholders, competitors, trade associations and local communities.

By applying stakeholder theory to the IT governance domain, this study looks to examine the importance given to external stakeholders' in IT governance context.

As mentioned earlier, According to this theory, power, legitimacy and urgency are the three attributes that qualify a stakeholder and determine its salience and thus informs on its importance as perceived by managers (i.e. IT executives). In this study, stakeholder attributes qualifications are adapted from Agle, Mitchell, and Sonnenfeld (1999) definitions. Thus, an external stakeholder is said to have ***power*** whether or not it is used, if it has the ability to apply a high level of direct economic reward or punishment (money, goods, services, etc.) and/or coercive force (lock, sabotage, etc.) and/ or positive or negative social influence (reputation, prestige, etc.) to obtain its will. An external stakeholder is characterized by ***urgency*** if its expectations (claims, demands or desires) are felt to be important and require immediate attention from the organization IT governing bodies. Finally, a stakeholder is said to be ***legitimate*** if there is a generalized perception by the organization IT governing bodies that its claims are proper and appropriate.

RESEARCH PROPOSITIONS

Freeman (1984) followed by Agle, et al. (1999) proposed that among stakeholder management process requirements, there is: (1) the identification of all relevant stakeholder groups in relation to the issue being addressed; (2) the determination of the stake and importance of each stakeholder group. We will follow these two steps to define and respond to our research propositions.

External stakeholder identification in IT governance context

The majority of IS research refers to individuals or groups internal to the organisation when dealing with stakeholders in IS (Pouloudi, 1999). This is also the case in most of the IT governance research (see previous section for more details). But information systems are now used inside and outside organizations and often require taking into account various stakeholders with sometimes conflicting needs and interests (Schlichter & Rose, 2013). This is the case for example of inter-organizational information systems, these systems operate in complex environments where people, groups and organizations have interests and needs that may affect or be affected by the inter-organizational systems put in place (Bahakiqaruto & Montagna, 2008). Intra-organizational systems are also influenced by external parties especially during their development or implementation. The case of ERP systems is a good example. The implementation of this type of extended systems can affect the interests of different stakeholders inside and outside the organization (Fowler & Gilfillan, 2003; Markus, Ahmed, Petrie, & Tanis, 2000). These same stakeholders can influence the design and implementation of such systems to satisfy their own interests (Boonstra, 2006). Some systems must also comply with rules and specific legislative standards related to third parties such as governmental entities, industries and so on (Bahakiqaruto & Montagna, 2008). For instance, as indicated by Hovelja, & al. (2013), companies that consider environmental stakeholders influence in their IT planning tend to produce more valuable IT strategic plans than others. On the basis of these arguments, the following propositions are formulated:

> *Proposition 1a: Organizational external stakeholders who can affect the organization's IT should be considered among the stakeholders of IT governance.*

Proposition 1b: Organizational external stakeholders who can be affected by the organization's IT should be considered among the stakeholders of IT governance.

External stakeholder prioritization in IT governance context

The level of stakeholder salience informs on its importance in a given context as it is perceived by the manager (Agle et al., 1999). As indicated by Mitchell et al. (1997), stakeholder's salience depends on the stakeholder's power to influence the organization, the legitimacy of the stakeholder's relationship with the organization and the urgency of the stakeholder's claim on the organization. These stakeholder's attributes are not objective but rather socially constructed reality (Mitchell et al., 1997). Indeed, the level of stakeholder salience informs on its importance in a given context as it is perceived by manager (Agle et al., 1999). Although the organization is supposed to meet the interests of all stakeholders, it is usually based on its dependence on this part (as a provider of resources) that the organization will grant him one priority compared to others (Jawahar & McLaughlin, 2001). As depicted in the literature revue, IT governance falls under the responsibility of internal stakeholders to the organization and focus on specifying their decisional rights and responsibilities over IT decision domains (Weill & Ross, 2005). Even if they do not hold a decision role within the IT governance framework, external stakeholders still remain part of this framework and can affect or are affected by IT governance. Their influence can be noticed through the power that may exercise on the different IT governance decision areas (i.e. IT decision domains); the legitimacy of their relationship with the organization's IT and the urgency of their claims as perceived by IT executives. For instance, this seems to be the case in IT strategic planning decision domain where influences of environmental stakeholders are considered in the formulation of the IT strategic plan (Hovelja et al., 2013). Since each IT decision domain has its specific characteristics, one's can think that the influence of external stakeholders on IT governance may also vary according to IT decision domains which are the IT governance decision areas (Grover, Henry, & Thatcher, 2007; Sambamurthy & Zmud, 1999; Weill & Ross, 2005; Weill & Ross, 2004). Based on these arguments, we issue the following propositions:

Proposition 2a: External stakeholders' degree of power, legitimacy and urgency is associated with their importance in IT governance context as perceived by IT executives.

Proposition 2b: External stakeholders' importance in IT governance as perceived by IT executives will vary according to IT decision domain.

METHODOLOGY

Research approach: qualitative survey

This study follows a qualitative research approach, namely a qualitative survey. According to Fink (2003), qualitative surveys gather information about the meaning that people give to their experiences and the ways in which they express themselves. Thus, the qualitative survey is an appropriate research strategy because it allows us to access to detailed information in the own words of respondents (Fink, 2003). In this research, the importance given to external stakeholders in IT governance is essentially captured through stakeholder's salience (the degree to which claims of competing stakeholders are given priority) as perceived by IT executives. As such, we relied on IT executives perceptions to understand how external stakeholders are prioritized in IT governance context.

More specifically, this research is conducted in two stages as follows:

Stage 1: external stakeholders' identification in IT governance context – this stage consists of the validation of the external stakeholders list identified from the literature with respondents. This list reports the following parties: IT suppliers, IT consultants, compliance, external audit & security groups, business customers, business suppliers, investors, shareholders, competitors, trade associations, local communities. We have also added a category 'others' to allow interviewed IT executives to propose other external stakeholders that they consider important in an IT governance context and that we have not specified in our list. This step allowed us to come up with a comprehensive list of external stakeholders that are considered in IT governance context.

Stage 2: external stakeholders' prioritization in IT governance context – assessment was conducted based on the theoretical integration of the Mitchell's et al. (1997) model of

stakeholders' identification and salience with the IT decision domains classification provided by Grover et al. (2007)[3]. This theoretical integration allow us to determine the importance given to external stakeholders in IT governance based on their prioritization according to the major IT decision domains experienced by organizations as part of a holistic IT governance framework. During interviews, respondents were asked to assess the level of power, legitimacy and urgency on a scale of 1 to 10 (1 being low and 10 being high) of each external stakeholder group and that for each IT decision domain. In addition to these values, respondents were asked to comment on their respective value choices (low, medium or high). They were also asked to elaborate on how external stakeholders may influence IT governance according to each decision domain.

Data collection

Data collection was performed through IT executives' interviews. IT executives (CIO, VP IT and other senior IT managers) are identified as key informants in this study given their direct involvement in IT governance of the organization. In fact, IT governance is situated at multiple levels in the organisation including the senior/executive management level (Van Grembergen, De Haes, & Guldentops, 2004) where business as well as IT are involved in the IT governance process (De Haes & Van Grembergen, 2009). IT executives as part of senior management are generally held responsible for IT decision making in the organization (De Haes & Van Grembergen, 2008; Peterson 2004; Weill & Ross, 2005) and have usually active participation in several IT governance organizational structures (e.g. different levels of steering committees) (De Haes & Van Grembergen, 2008; IT Governance Institute, 2003). Moreover, by interviewing IT executives who are highly knowledgeable about major IT governance decision domains (i.e. decisions on IT strategy, IT architecture, IT infrastructure, etc.) we minimize data inaccuracy as proposed by Segars and Grover's (1999). Therefore, they are able to talk and bring valuable information about the research questions under study.

[3] A number of frameworks have been proposed to categorize major IT governance decision domains. In this study, we have chosen to use the classification of Grover et al. (2007) as it covers a wider range of decision domains comparing to other classifications in the literature. Moreover, the reason for the combination of the Grover's et al. classification with the Mitchell's model is that the later is pretty generic. It allows the identification of organizational stakeholders as a whole. However, IT governance is depicted through TI decision domains as illustrated by past research. Therefore, we need to examine external stakeholders' prioritization on the different decision domains.

The interviewees were selected according to a "purposive sampling" strategy (Patton, 2002). Interviewed IT executives are representing a wide range of experience, both in the number of years of experience in general management of IT, in terms of background, geographic origin (Quebec, Ontario, and Alberta) and business sectors (companies having activity of production or services, banks, insurance, governmental organizations, consultant firms). These series of interviews with IT executives were made to obtain the widest variety in responses. The Canadian edition of the directory of *top Computer executives* for 2013 was our sampling frame. Sixty-five IT executives have been identified and contacted by e-mail. Thirteen people have accepted to participate in our study. An interview was not completed due to professional commitments of the interviewed. Therefore, the final sample consisted of twelve people. Descriptive statistics on the respondents and their respective organizations are presented in table 2. Eleven of the twelve interviews were conducted by phone, because of the geographical location of the respondents or to offer more flexibility to them given their busy agenda. Interviewees provided their informed consent prior to interviews. Interviews were lasted approximately between 45 minutes and one hour and a half. All the interviews were recorded and later transcribed. Some interviews were conducted in French (preferred language for interviewees from Quebec), and were translated verbatim into English by the first author, a French speaker. If any points of doubt regarding the sense of sentences were raised during the transcription and translation process, a second native speaker was consulted.

Article 3 - Table 2. Descriptive Statistics of the Final Sample

Respondents characteristics					Organizational background				
ID	**Title**	**Gender**	**General Management of IT Experience (years)**	**Education**	**Number of IT employees**	**Industry**	**IT Units**	**Organization Number of employees**	**Ratio of the TI budget**
ITE1	IT Architect Leader	M	7	Master	150	Financial services	8	2200	Confidential
ITE2	CIO	M	21	Master	300	Manufacturing & engineering & service	7	16000	2.8%
ITE3	CIO	M	2.5	Master	60	insurance	7	500	1.3%
ITE4	VP IT	M	15	Bachelor's degree	50	service	5	1200	6%
ITE5	VP IT	M	30	Master	3000	banking	20	48000	8%
ITE6	IT director	M	25	Diploma of collegial studies	8	Manufacturing & processing	2	200	5%
ITE7	VP IT	M	25	Diploma of collegial studies	350	service	1	350	Confidential
ITE8	IT director	M	18	Bachelor's degree	30	Agency Government laws	3	120	30%
ITE9	Enterprise Architect	M	15	Master	150	insurance	6	1600	Confidential
ITE10	CIO	M	6	Ph.d.	375	education	5	10000	5%
ITE11	CIO	M	21	Ph.d.	150	Higer education	8	3200	2%
ITE12	CIO	F	23	College D.	25	Education	3	2000	1.5%

During the semi-structured interviews, the questions focused on the level of importance given to external stakeholders in IT governance covering six areas of decision domains in accordance with the classification of Grover et al. (2007), namely: IT strategic vision, IT architecture, IT investment, IT infrastructure, IT application development and IT outsourcing. Interview questions also focused on the perception of IT executives regarding external stakeholders' stakes in IT. In addition, like past research (Guerci & Shani, 2013; Magness 2008), we asked the respondents to assess the level of power, legitimacy and

urgency on a scale of 1 to 10 (1 being low and 10 being high) of each external stakeholder group and that for each IT governance decision domain. In addition to these values, respondents were asked to comment their respective choices (low, medium or high). The use of quantitative data in a qualitative survey does not jeopardise the qualitative nature of this research. In fact according to Jansen (2010), "*A study on body length is a qualitative survey if it searches for the categories (values) of this dimension that are present in a given population and if it uses these metrics data as categorical data in further analysis*." Requested scores constitute complementary information to the interviews content analysis. This combination allows us to have a more holistic picture of IT executives' prioritization of external stakeholders groups in IT governance. The interview protocol is included as Appendix A.

Interview questions focused on the list of external stakeholders that we have identified from IS research (Grover, Henry et al. 2007; IT Governance institute, 2003; 2005; 2011; Peterson, 2004; Rau, 2004; Weill & Ross, 2005) and management literature (Agle et al. 1999; Argandoña 1998; Berman, Wicks et al. 1999; Donaldson & Preston 1995). This list reports the following parties: IT suppliers, IT consultants, compliance, external audit & security groups, business customers, business suppliers, investors, shareholders, competitors, trade associations, local communities. We have also added a category 'others' to allow interviewed IT executives to propose other external stakeholders that they consider important in an IT governance context and that we have not specified in our list.

Data analysis

We followed the procedure of content analysis of Fink (2003) as well as additional complementary data representation and coding methods (Miles & Huberman, 1994; Langley, 1999; Patton, 2002) to perform our data analysis according to a qualitative approach. Qualitative data and analysis are appropriate when "how" and "why" questions are asked (Fink, 2003; Patton, 2002). Given that the objective of the present study is to determine the importance given to external stakeholders in IT governance context by examining how they are prioritized in IT governance context.

To do so, we have proceeded in two stages. In the first stage, we presented the list of external stakeholders identified from the literature to our respondents in order to see if the

external stakeholders identified are considered among IT governance stakeholders according to our respondents. This step allowed us to come up with a comprehensive list of external stakeholders that are considered in IT governance context. The second stage was to collect data on external stakeholders' prioritization in IT governance as perceived by IT executives based on the validated list.

The interviews were transcribed and codified using a developed coding grid which is based on Mitchell et al. (1997) model and the IT decision domains classification of Grover et al. (2007). The content analysis of the interviews was made to examine how external stakeholders are prioritized by IT executives in IT governance across six major IT decision domains (i.e. IT strategic vision, IT architecture, IT investment, IT infrastructure, IT applications development, IT outsourcing). During the codification procedure, we have used a combination of deductive and inductive analysis approach. As a first step, we comb through the transcripts and note every instance of support for the preselected themes initially designed in the coding grid. This deductive approach allowed as categorizing data using the list of codes initially developed based on the definitions associated with the sixth IT decision domains of Grover et al classification (2007) and the three stakeholders' attributes of the Mitchell et al. model (1997). Then, we went through an inductive approach, by looking for dominant themes that we didn't consider at first place in our coding grid. Thus, *external stakeholder influence type* has emerged as new theme from the analysis process and has been added to the coding grid after validation with the authors of this article.

All interviews were coded according to the same procedure. We have initially selected two interviews randomly and coded them according to the coding grid. The result of the codification was subsequently discussed with the authors of this article to verify the content of the grid and its interpretation. This verification led to minor adjustments made to the labeling of the definitions of our grid. Subsequently, all previously transcribed interviews were coded based on the revised coding grid. The list of codes we used and their definitions are presented in Appendix B.

In addition to content analysis of the interviews, scores provided by respondents to the three attributes (power, legitimacy and urgency) have enabled us to calculate the level of

salience of each stakeholder as perceived by IT executives. Following past research (Guerci & Shani, 2013; Magness 2008), we formulated an indicator of salience that sums up how stakeholders are considered powerful, legitimate and urgent. The salience value was computed for each external stakeholder group, by averaging together the power, legitimacy and urgency ascribed to each stakeholder by all respondents for each IT decision domain. The salience indicator in addition to the content analysis built upon the data interviews allowed us to deepen our understanding about external stakeholder prioritization in IT governance.

RESULTS AND DISCUSSION

External stakeholder identification in IT governance context

Our objective at this stage of the research is to identify external stakeholders, which are taken into account by IT executives in IT governance decision-making. The validated list of external stakeholders that are considered in IT governance context is presented in *table 3* as follows:

Article 3 - Table 3. List of External Stakeholders Considered in IT Governance

External Stakeholders groups	Rationale	Impact on organization's IT	Stake in IT	Respondents
IT vendors	This group includes both TI consultants, computer equipment vendors, and the consulting firms in TI and other organizations for the promotion of best practices in TI.	*affect*	Influence of business lines to adopt their solutions, technologies and best practices.	all
Compliance, external audit & Security group	This group includes external auditors, governmental and industry regulatory bodies as well as of the teams ensuring compliance in terms of security.	*affect*	Respect their recommendations.	all

External Stakeholders groups	Rationale	Impact on organization's IT	Stake in IT	Respondents
Business customers	Is all business customers who are in the organizational boundary.	*Affect and affected by*	Reliability and availability of the systems at their disposal.	all
Business suppliers	This category includes suppliers of business of the organization.	*Affected by*	Implementation does not place systems that allow a better communication with them.	all
Investors & shareholders	Brings together providers of funds of the organization.	*Affect*	Performance, compliance with the IT budget, cost reduction and optimization of processes.	all
Competitors	The different competitors of the Organization	*affect*	Monitor our IT products. Provide best services and IT products.	all
Trade associations	Brings together trade unions and professional bodies.	*Affected by*	Offer IT products and services that respond to their requests.	all
Local communities	The public (including media), the city and the country in which operates the organization.	*Affected by*	Recognition of their cultural particularity, their needs.	all
Joint ventures	A business arrangement in which two or more parties agree to pool their resources for the purpose of accomplishing a specific task. The venture is its own entity, separate and apart from the participants' other business interests.	*Affect and affected by*	Access to technological tools which allow the development of products or services in common.	ITE2, ITE5

During interviews, we have validated with IT executives the content of the list of external stakeholders identified from the literature review. Respondents suggested the grouping of categories «investors» and «shareholders» together because of their common vocation of purveyors of funds for the organization. They also suggested that we combine IT consultants and suppliers of hardware equipment including networking providers under the same group that we have named "IT vendors". In addition, the majority of respondents (ITE2, ITE4, ITE5, ITE7, TE8, ITE9, ITE10, and TE12) considered that the group "trade associations" should refer only to the trade unions and professional orders. According to our respondents, associations and other agencies promoting IT best practices such as market analysts should be categorized with "IT vendors". In addition, two respondents (TE2, TE5) suggested an additional group that was not present in the preliminary list, namely *joint ventures*. After validation of this new group with the other respondents, we decided to add it in the final list of external stakeholders that can be considered within an IT governance context. Table 3 presents the list of external stakeholders after validation with IT executives.

In addition, all IT executives interviewed said that some of the stakeholders presented in table 3 affect organizations' IT. This is the case for example of compliance, audit & security group or investors & shareholders. Other stakeholders are instead affected by the organization's IT such as business suppliers. Some others stakeholders affect and are affected by the organization's IT through their requirements like business customers. In addition, according to our respondents the different stakeholders identified had stakes in IT and therefore they could influence IT governance. A synthesis of the stakeholders' stakes in IT as perceived by IT executives were identified during interviews and synthesized in table 3.

The validation process of the external stakeholders list with respondents allowed us to validate propositions **1a** and **1b** of this study.

External stakeholder prioritization in IT governance context

Our goal at this stage of the research was to examine how external stakeholders are prioritized given their level of salience as perceived by IT executives. The level of salience attributed to each external stakeholder group informs on its importance compared to other stakeholders groups.

According to Mitchell et al. (1997) the prioritization of stakeholders by managers is performed on the basis of their level of *saliency*. Saliency refers to "the *degree to which managers give priority to competing claims*" (Mitchell et al., 1997) which inform on their importance as perceived by managers. Stakeholder salience is determined by the level of power, legitimacy and urgency given to his claims as perceived by managers (Mitchell et al., 1997). On the basis of the indicator of salience that we calculated for each stakeholder and in accordance with the findings of Agle et al. (1999), showing that "*the stakeholders attributes of power, legitimacy and urgency are individually and cumulatively related to stakeholder salience*" (Agle et al., 1999, p.520), we were able to compare the salience of the various external stakeholders in IT governance. Analysis of the data (computed salience' scores and content analysis of the interviews) reveals that, in IT governance context, the importance given to external stakeholders varies according to IT decision domains as perceived by IT executives. Following Guerci & Shani (2013) scale's specification, respondents thus assigned each external stakeholder group a different salience value ranging from high (> 7, on a 1-10 scale) to low (< 4, on a 1-10 scale) level depending on IT decision domain. In addition, the content analysis of the additional information and comments provided by respondents on stakeholder salience attributes brought additional insights on how external stakeholders' are prioritized according to IT decision domains. Furthermore, the content analysis of our interviews reveals that external stakeholders may directly or indirectly influence the governance of IT decision domains depending on their active role in the organization's IT or on their relationship with the organization as a whole. Table 4 presents a summary of these findings. Below is a detailed description of the prioritization of each external stakeholder group as perceived by respondents.

Article 3 - Table 4. Prioritization of External Stakeholders in IT Governance as Perceived by IT Executives																		
	IT strategic vision			IT architecture			IT investments			IT infrastructure			Application development			IT outsourcing		
Influence	Direct			Indirect			Direct			Indirect			Indirect			Direct		
Importance	High			Moderate			High			Moderate			Moderate			High		
Investors & shareholders	P High	L High	U High	P Mod	L High	U Low	P High	L High	U Mod	P Low	L High	U Mod	P Mod	L High	U Mod	P High	L High	U High
Influence	Indirect			Indirect			Indirect			Indirect			Indirect			Indirect		
Importance	High			High			Moderate			High			High			High		
Compliance External Audit & Security Group	P High	L High	U High	P High	L High	U Mod	P Mod	L High	U Low	P High	L High	U High	P High	L High	U Low	P High	L High	U High
Influence	Indirect			Direct			Indirect			Direct			Direct			Direct		
Importance	Moderate			High			High			High			Moderate			Moderate		
IT vendors	P High	L High	U Low	P High	L High	U Mod	P Mod	L High	U Mod	P High	L High	U High	P Mod	L High	U Low	P Mod	L High	U Low
Influence	Indirect			Indirect			Indirect			Indirect			Indirect			Indirect		
Importance	High			High			High			High			High			Moderate		
Business customers	P High	L High	U High	P High	L High	U Mod	P High	L High	U Mod	P Mod	L High	U High	P High	L High	U High	P Mod	L Mod	U Low
Influence	Indirect			Indirect			Indirect			Indirect			Indirect			Indirect		
Importance	High			Moderate			Moderate			Moderate			Low			Low		
Competitors	P High	L High	U High	P Low	L High	U Mod	P Mod	L High	U Low	P Low	L Mod	U Mod	P Low	L Mod	U Low	P Low	L Mod	U X

	IT strategic vision			IT architecture			IT investments			IT infrastructure			Application development			IT outsourcing		
Influence	**Indirect**			**Indirect**			**Indirect**			**Indirect**			**Indirect**			**Indirect**		
Importance	**Low**			**Low**			**Low**			**Low**			**Low**			**Low**		
Business suppliers	**P Low**	**L High**	**U Low**	**P Low**	**L Mod**	**U Low**	**P Low**	**L High**	**U Low**	**P Low**	**L High**	**U Low**	**P Low**	**L Mod**	**U X**	**P Low**	**L Mod**	**U Low**
Influence	**Indirect**			**Indirect**			**Indircet**			**Indirect**			**Indirect**			**Indirect**		
Importance	**Low**			**Low**			**Moderate**			**Low**			**Low**			**Low**		
Trade Associations	**P Low**	**L High**	**U Low**	**P Low**	**L Low**	**U Low**	**P Mod**	**L Mod**	**U Low**	**P Low**	**L Low**	**U Low**	**P Low**	**L Low**	**U Low**	**P Low**	**L Mod**	**U Low**
Influence	**Indirect**			**Indirect**			**Indirect**			**Indirect**			**Indirect**			**Indirect**		
Importance	**Low**			**Low**			**Low**			**Low**			**Low**			**Low**		
Local communities	**P Low**	**L Mod**	**U Low**	**P Low**	**L Low**	**U Low**	**P Low**	**L Mod**	**U Low**	**P Low**	**L Mod**	**U Low**	**P Low**	**L Mod**	**U Low**	**P X**	**L Low**	**U X**
Influence	**Indirecte**			**Indirecte**			**Indirecte**			**Indirecte**			**Directe**			**Directe**		
Importance	**Low**			**Low**			**Low**			**Low**			**Moderate**			**Moderate**		
Joint ventures	**P Low**	**L Mod**	**U Low**	**P Low**	**L Mod**	**U Low**	**P Low**	**L Mod**	**U Low**	**P Low**	**L High**	**U Low**	**P Mod**	**L Mod**	**U Low**	**P Mod**	**L Mod**	**U X**

P : level of stakeholder power as perceived by respondents

L : Level of stakeholder legitimacy as perceived by respondents

U : Level of urgency of stakeholder claims as perceived by respondents

X : Respondents consider that the stakeholder don't possess this attribute

Importance: refers to salience score and is determined from stakeholder salience attributes (Power, Legitimacy, Urgency)

Investors & shareholders group. Respondents gave a high importance to the group of investors & shareholders in IT strategic vision decisions (ITE1, ITE2, ITE3, ITE4, ITE5, ITE6, ITE7, ITE9, ITE11 and ITE12), IT investments planning (ITE2, ITE3, ITE4, ITE5, ITE6, ITE7, ITE8, ITE9, ITE10, ITE11, ITE12) and IT outsourcing (ITE4, ITE5 ITE6, ITE7, ITE8, ITE9, ITE10, ITE11, ITE12). Respondents consider that this group has a direct influence on the governance of theses IT decision domains. Respondents explain that given their funding role including IT funding, this group has a great influence on IT budget allocation. Apparently, investors & shareholders hold a utilitarian power following the description of Mitchell et al. (1997). ITE9 comments "*it's almost the shareholders who decide our IT budget*". It also influence IT investments. ITEx4 commented "*they are who pay then the costs become an extremely important issue for them. We must be able to explain the "why" of the budgetary envelopes and the financial efforts that we are asking from them. They will follow us very strictly on the adherence to schedules and the respect of deadlines"*. They may also intervene and influence the choice of the IT outsourcing contractor. ITEx4 says, "*Our board of directors is very sensitive on this point, much for legitimacy purpose. Our investors on the board want to understand the potential impacts on customer visibility that their investments could have"*. Their involvement in this case is perceived highly legitimate and theirs claims are treated with urgency given the monetary impact that they may have on such decisions.

Investors & shareholders are however seen as moderately important in IT architecture decisions (ITE1, ITE3, ITE4, ITE5, ITE6, ITE7, ITE8, ITE11, and ITE12), IT infrastructure decisions (ITE3, ITE4, ITE8, ITE10, ITE11, ITE12) and applications development decisions (ITE1, ITE3, ITE4, ITE5, ITE6, ITE8, ITE9, ITE10, ITE11, and ITE12). The respondents consider that the influence of investors & shareholders is indirect at this level. ITE1 says "*indirectly yes [...]so if they tell us to be 'customer centric' and offer new business lines of consultation we have to implement technological solutions which correspond to these strategic needs and to adapt our architecture accordingly"* . The respondents think that it is very legitimate to prove to investors and shareholders that the injected money in IT are well used and this is translated concretely by technological facilities and equipment that meet the business needs. ITE4 states "*it is much a matter of legitimacy. They are paying then costs become an extremely important issue for them. We*

must be able to show them that we have made good use of these technology investments [...] and that we respect the budgetary constraints". Their demands are also taken into account in IT investment decisions. ITE10 says "we *need to demonstrate transparency. We have to be able to explain and to demonstrate that we correctly handle investments in IT*". Their claims in this regard are seen as moderately urgent to respond to.

The compliance, external audit & Security group. The respondents ascribe a high level of importance to compliance, external audit & security group in IT strategic vision decisions (ITE1, ITE3, ITE4, ITE5, ITE8, ITE9, ITE11 and ITE12), IT architecture decisions (ITE1, ITE2, ITE3, ITE4, ITE5, ITE6, ITE8, ITE9, ITE10, ITE12), IT infrastructure decisions (ITE1, ITE3, ITE4, ITE5, ITE6, ITE8, ITE9, ITE10, ITE11, ITE12), applications development decisions (ITE1, ITE2, ITE3, ITE4, ITE5, ITE6, ITE7, ITE9, ITE10, ITE11, ITE12) and IT outsourcing decisions (ITE4, ITE5, ITE6, ITE7, ITE8, ITE9, ITE10, ITE11, ITE12). This group has an indirect influence on these different IT decision domains. According to Freeman (1984), as part of its institutional power, this group dictates the legislative frameworks to which organizations must generally comply such as in information security level or for compliance with industry or legal laws. The recommendations of these regulatory bodies will be translated in terms of business rules for information systems of the organization (Li et al., 2012). For instance, ITE4 mentions "*They are very important, yes. There are a lot of decisions or on how we'll orchestrate all of the IT delivery that is greatly influenced by the constraints or the expectations of these regulatory frameworks. If these regulatory frameworks were not there the TI delivery will be very different*". The compliance, external audit & security group may even act on decisions pertaining to IT outsourcing according to the respondents opinions. For instance, ITE5 says "they *are going to influence us in terms of the choice of the outsourcer or on how to make outsourcing according to the generated risk*". The relationship with this group is perceived as highly legitimate. Claims in this regard are seen to be treated mostly with moderate to high urgency.

However, the compliance, external audit & security group holds a medium importance in IT investment decisions (ITE2, ITE3, ITE4, ITE5, ITE6, ITE7, ITE8, ITE9, ITE10, ITE11, ITE12). Respondents consider that they also have an indirect influence on this IT decision

domain. ITE8 says "*of course, with laws and regulations when it is said for example that we should be accessible web, it causes projects so we'll cause investments. They are investments that result in salaries, in consultation for example. This may delay some projects or prioritize other projects. Yes, it has an impact*". However, respondents seem to consider the claims in this regard with little urgency.

IT vendors. The majority of respondents ascribe a high level of importance to the IT vendors group in IT architecture decisions (ITE1, ITE2, ITE3, ITE4, ITE5, ITE6, ITE8, ITE9, ITE10, ITE12), IT investment (ITE2, ITE3, ITE4, ITE5, ITE6, ITE7, ITE8, ITE9, ITE10, ITE11, ITE12) and IT infrastructure decisions (ITE1, ITE3, ITE4, ITE5, ITE6, ITE8, ITE9, ITE10, ITE11, ITE12). Our respondents think that technological feasibility of the IT architecture and the IT infrastructure is often limited by what the IT vendors offer as technological products or IT services on the market. Thus, we can say that this group has a utilitarian power as described by Mitchell et al. (1997). ITE6 commented "*altogether, with the limitations of possible solutions in the market or what they see as evolution in the market of their own technologies[...] so when we plan IT architectures if one has the best strategy but no provider that offers something to be able to meet the needs this will influence our strategies"*. The claims of this group are therefore treated on a priority basis in this context. IT vendors have also an influence on IT investment decisions as stated, for instance, by ITE1 "*Yes they have power. They define a part of the architecture so we are left to buy products they recommend to us*".

Respondents believe however that IT vendors moderately affect decisions on IT strategic vision (ITE2, ITE3, ITE4, ITE5 ITE6, ITE7, ITE10, ITE11, ITE12) and those dealing with applications development (ITE1, ITE3, ITE4, ITE5, ITE6, ITE8, ITE9, ITE10, ITE11, ITE12). The influence of IT vendors on IT strategic vision decisions is "much *more indirect. IT vendors influence top management by the sales aspect and marketing tools, and the IT level have often to catch up*" (ITE5). This is the case for example of consulting firms that do benchmarking analysis. They can indirectly influence the IT orientation and vision of the organization throughout the market research they produce on the trends they promote in terms of best practices. Respondents don't see any urgency in responding to their claims at this level.

IT vendors directly influence applications development decisions given their involvement in systems development projects on a contractual basis as an outsourcer or through the consulting services they provide as consultants. ITE6 commented "they *have some influence. It is mainly at the level of the structure and the development process. They participate in management process and at applications development mainly through their promotion of the use of best practices such as ITIL or CMM*". Their recommendation rather than claims are not perceived to be urgent.

Business customers. Most respondents associate a high level of importance to business customers in the governance of almost all IT decision domains, namely: IT strategic vision (ITE1, ITE3, ITE4, ITE5, ITE8, ITE9, ITE11 and ITE12), IT architecture (ITE1, ITE2, ITE3, ITE4, ITE5, ITE6, ITE8, ITE9, ITE10, ITE12), IT investment (ITE2, ITE3, ITE4, ITE5, ITE6, ITE7, ITE8, ITE9, ITE10, ITE11, ITE12), IT infrastructure (ITE1, ITE3, ITE4, ITE5, ITE6, ITE8, ITE9, ITE0, ITE11, ITE12) and applications development (ITE1, ITE2, ITE3, ITE4, ITE5, ITE6, ITE7, ITE9, ITE10, ITE11, ITE12). The influence of business customers on these IT decision domains is rather indirect. It is indeed through line management that customers' needs are communicated to the IT function. Respondents believe that although their influence is indirect, their power is high in this context. According to the description of Mitchell et al. (1997), business customers have normative power taking into account their influence on the image of the organization as a whole but also utilitarian as they are the main source of revenue for the organization. Respondents also associate business customers with a high level of legitimacy and urgency in the processing of their claims. For instance, ITE10 said about business customers "*they do not endorse the decisions but they motivate decisions. We exchange with them. They still have power on the reputation, prestige and money. Not meeting their needs is constraining our source of revenue*".

Customers are however considered as being moderately important in IT outsourcing decisions. They may indirectly influence governance decision making within this domain. Indeed, the organization wanting to please its customers could decide to choose IT outsourcers in a way that benefit its brand image and reputation with its business customers. ITE5 says "*Yes, it can have an impact on the image. External client could badly*

react if we decide to give the contract to a non-local firm. We consider the client reaction in our decisions. We could even have reciprocity with the client". However, respondents don't consider their claims with urgency to this regard.

Competitors. Most of the respondents (ITE1, ITE3, ITE4, ITE5, ITE8, ITE9, ITE11 and ITE12) associate a high level of importance to competitors in the governance of IT strategic vision decision. Taking into account the achievements of the competitor is required in the IT strategic plan; this is what our respondents revealed. ITE8 indicates for example that "*their influence is in the form of investments they make to get the market, so if we see penetrations in the market to offer new services [...] it influence our IT strategic vision. So there is a constant analysis of the competition in order to adjust our strategic plan*".

In addition, respondents gave a moderate level of importance to competitors in IT architecture (ITE1, ITE3, ITE4, ITE5, ITE6, ITE7, ITE8, ITE11, ITE12), IT investment (ITE4, ITE5, ITE6, ITE7, ITE8, ITE11, ITE12) and IT infrastructure (ITE3, ITE4, ITE5, ITE6, ITE7, ITE8, ITE11) decision-making. Respondents believe that their influence in these domains is indirect. They explain that a constant analysis of the competition in terms of technology trends and innovation (Benchmark), will indirectly influence the governance of these IT decisions especially in technological choices to retain in IT architecture and IT infrastructure settings. For instance, ITE1 mentions "*if we discover that a competitor has taken the lead on us so we'll want to catch up or overtake this advance, and the changes that we do will also impact the IT architecture*". Their influence can also cause adjustments on IT investments level considering the analysis of competition and their technological innovations. ITE5 said "there *is a constant analysis of the competition in order to adjust our IT investments plans*". This analysis of the competition is perceived as very legitimate and requires special attention on the part of IT executives.

Furthermore, respondents give very little importance to competition in governance decisions concerning the development of IT applications and those related to IT outsourcing. Although, these same respondents believe that it is legitimate to consider what the competition is doing in these domains (ITE2, ITE3, ITE10, ITE4, ITE12, ITE8, ITE9) for benchmark reasons.

Business suppliers. All respondents give very little importance to business providers in IT governance decision-making. ITE1 comments "*They are small players in relation to us. Service providers that's all*". However, they consider that it is legitimate to consider their demands in IT governance decisions on a voluntary basis and it is in this way that they can influence them indirectly. For instance, ITE6 said about business suppliers "*there may be some cases where suppliers need to offer us a new product or an additional service, this have to be considered in our IT architecture plan*".

Trade associations. All of the respondents give very little importance to trade associations in IT governance decisions in general. Respondents consider that this group has no power over IT governance decision-making in general but it remains legitimate to consider its requests on a voluntary basis. However, trade associations according to our respondents have a medium importance in the governance of IT investment decisions. The respondents' stress out that unions can make pressure to abort an IT investment project thinking that it is against the benefit of its members. ITE12 explains "*If the board makes investments on technology, there are times where the union can object to it [...] say if they perceived it in a way that it goes against the rights or benefits of employees. You know in a strike situation they will try to manifest their disagreements like saying you shouldn't buy that type of technology*". Thus, it appears that this group holds a power that could be described as coercive on IT investment decisions in accordance with the description of Mitchell et al. (1997). Respondents consider this group moderately legitimate and their claims moderately urgent to process.

Local communities. All respondents give little importance to local communities in IT governance decision-making in general. They consider that this group has no real power over decision-making but it remains legitimate to consider its interests or requests without urgency. In some cases, this group is perceived as a pool of potential business customers (ITE3, ITE10, ITE4, ITE12, ITE8) that the IT function will attempt to satisfy by filling existing needs or future ones identified through market research provided by business lines to IT executives. Thus, the business needs that could emerge from market analysis may indirectly influence IT governance decisions, through the implementation of the required change at TI architecture level for example. For instance, ITE8, says "*we want to ensure a*

24/7 service so we put in place architectures that are stronger than what we had previously. We also want to be sure that we respond to the needs of the population which are communicated to us through our customer service. For instance, we put in place measures of access to persons with disabilities on our website as a response to population requests". In other cases, the local community is seen as a pool of potential human resources for the IT function. ITE9 says "*the availability of human resources [...] skills that exist in a region often will influence what kind of infrastructure we're going to develop java for example [...] well it's not going to depend only on this but it's going to be influenced by labour basin*". Marginally, the local community could have normative power according to the Mitchell et al. (1997) description by feeding some debates on IT issues. For example, ITE10 indicates that the influence of the local community on IT governance decisions may be "in *terms of reputation*. *The debate on open source versus proprietary software is a good example. It is an eternal debate. Public opinion or even journalists can have a direct impact on this issue*". In general, respondents were more likely to recognize the legitimacy of claims or interests of this stakeholders group but did not see in this group real power or urgency that may affect overall IT governance.

Joint ventures. In general, respondents give little importance to the group of joint ventures in the governance of IT strategic vision decisions, IT architecture decisions, IT investments decisions and IT infrastructure decisions. They admit that it is very legitimate to take into consideration their needs in these decision domains assuming that they can influence them indirectly but consider however that their power over such decisions remains low. ITE2 says "*we made an alliance to create a new product. We may influence each other to promote technological compatibility. It is therefore legitimate to consider that in our decisions*". On the other hand, the respondents consider that joint ventures group is moderately important in the governance of applications development decisions and decisions related to IT outsourcing. The influence of this group is direct in this context. Respondents argue that the development of common product or service usually generates discussion on the development procedures that both parties will use. Thus, the option of "making together" rather than "buy" promote such strategic alliances (Poulin et al., 1994). The business partner may also intervene in the choice of the TI outsourcer for the service or product they have in common. ITE5 precise "*there is an impact. There must be agreement*

on the service of outsourcing for the development that we have in common. This will influence the common solution that we will put in place".

In conclusion, it appears that stakeholder salience which is determined by the degree of power, legitimacy and urgency as stipulated by Mitchell et al. (1997) informs on his importance as perceived by IT executives. Thus, all external stakeholders identified were not evaluated in the same way by the respondents given the scores provided in addition to their comments on the issue. This enables us to respond to proposition 2a of this research. In addition, as indicated in the results of this research the importance given to an external stakeholder varies according to IT governance decision domains. This enables us to respond to proposition 2b of this research.

Finally, analysis of the data reveals that external stakeholders can directly or indirectly influence IT governance decision domains. This depends on their involvement in a given TI activity or on the relationship that they have with the organization. For example, respondents noted that investors & shareholders directly influence governance decisions on IT strategic vision. This is mainly due to the fact that they can sit on the boards of directors and participate in the approval of the strategic plans (ITE4). So they have a direct role to play at this level. IT vendors constitute another example of external stakeholders who directly influence decisions on IT architecture, IT infrastructure, applications development and IT outsourcing. This group is involved because of his role as a consultant or outsourcer so their influence is direct in this context. The parties which indirectly influence IT governance decisions will do so through a third party, notably through the business units that are in direct contact with them. This is the case for example of business customers or business suppliers and even joint ventures. On the basis of these new data, we confirmed the following proposition:

> *Proposition 3: According to their role,* some *external stakeholders have direct influence on the governance of IT decision domains while others have an indirect influence.*

CONTRIBUTIONS, LIMITS AND AVENUES OF FUTURE RESEARCH

The contribution of this study to existing IT governance literature is recognized by its theoretical perspective. This study is to our knowledge the first to have empirically applied stakeholder theory and specifically the stakeholders' identification and salience model of Mitchell et al. (1997) to analyse external stakeholders' prioritization in IT governance context. Previous research on IT governance has essentially focused on the study of internal stakeholders to the organization through the definition of their roles and responsibilities in IT governance decision-making. In fact, this study is an attempt to fill a gap in IT governance research by examining the importance given to external stakeholders in IT governance context. The Mitchell et al. (1997) model combined with the IT decision domains classification of Grover et al. (2007) formed our analytical framework to examine external stakeholders' salience in IT governance which is considered as an indicator of their perceived importance in this context. The study revealed that external stakeholders' prioritization in IT governance varies according to IT decision domains. In addition, external stakeholders influence on IT governance can be direct or indirect depending on their involvement within the IT organization in particular, or the organization as a whole.

On the practical level, the results of our study emphasize the importance of the management of external stakeholders in IT governance. This can help IT executives to proactively determine ways to reduce negative impacts on and of the groups with less influence and power within the organization. A thorough stakeholder analysis can also identify potential conflicts or risks that could jeopardize IT governance, as well as opportunities and strategies for stakeholder management. Moreover, taking account of the needs and interests of the various stakeholders both internal and external can lead to a more effective IT governance (IT Governance Institute, 2011).

Like all research, this study has some limitations. Due to the small size of the sample, we cannot generalize the results of this study. Furthermore, with this study we have mainly considered the opinion of IT executives (i.e. CIOs and IT VPs). Consideration of business executives in the organization could eventually enrich our contribution by bringing additional perception on external stakeholders' salience in IT governance. A broader qualitative study could verify this. Moreover, future research could examine the salience of

all stakeholders in IT governance context by considering external as well as internal stakeholders' attributes in a global model. This could bring a comprehensive classification of relevant stakeholders in IT governance context and allow business directors to establish a fair balance of stakeholder's claims and interests inside and outside the organization.

Finally, given the exploratory nature of this study, new research may deepen the results of this study by adopting different empirical approaches such as the administration of a large scale survey to validate the results of this study. In addition, the study of contextual variables such as the type of industry, the reporting level of the decision-maker in the organization and even the size of the external stakeholder might bring additional valuable information on external stakeholders' management in IT governance context.

CONCLUSION

Research on IT governance has essentially focused on internal stakeholders to the organization through the definition of their roles and responsibilities in IT governance. Although external stakeholders have no decisional roles in IT governance, it appears that they can impact the governance of IT decision domains. This is what we have found in this study. Thus, investors & shareholders, compliance, external audit & security group, IT vendors, business customers, business suppliers, competitors, trade associations, local communities and joint ventures all have an influence on IT governance. This influence can occur directly or indirectly depending on their role and their involvement in IT activities, or on their relationship with the organization as a whole. In addition, the results of this study reveal that the importance given to external stakeholders in IT governance as perceived by IT executives varies according to IT decision domains.

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APPENDIX

Appendix A - Interview Guide

Section 1: Respondent information

- What is your title?
- For how many years have you been managing IT?
- What is your background? (Education, industry experience).
- What is your current company background? (industry, number of employees)
- How many full IT employees work in your current corporate IT department? How many major subunits does the IT department have?
- What is the ratio of your the current IT budget that you are managing to total company budget?

Section 2: External stakeholders importance assessment

IT governance decisions usually involve several stakeholders having divergent claims. Stakeholders are those groups who have either a responsibility for or an expectation from the enterprise's IT. This section aims to measure the importance of several external stakeholder groups in IT governance decisions. The importance of a stakeholder group is captured via the following attributes: **Power**, **Urgency** and **Legitimacy**.

- A stakeholder group is said to have **Power** whether or not it is used, if it has the ability to apply a high level of direct economic reward or punishment (money, goods, services, etc.) and/or coercive force (lock, sabotage, etc.) and/ or positive or negative social influence (reputation, prestige, etc.) to obtain its will.
- A stakeholder group is characterized by **Urgency** if its expectations (claims, demands or desires) are felt to be important and require immediate attention from your company IT governing bodies.
- A stakeholder group is said to be **Legitimate** if there is a generalized perception by your company IT governing bodies that its claims are proper and appropriate.

2.1 Based on your perceptions, for each of the IT decisions presented in the following table, please indicate (on a scale of 1 to 10) if the stakeholder group has **Power (P)**, **Urgency** (**U)**, and/or **Legitimacy (L)** (Please keep in mind the definitions of power, urgency and legitimacy presented above when assessing stakeholders' importance). **Please, comment your choice.**

For example, if a specific stakeholder is considered to have **Power of 7** on **IT strategic vision**, **Legitimacy of 6** and **Urgency of 3** on **IT investments**, the table should be filled in as follows:

IT decisions / **External stakeholder groups**	**IT strategic vision** *Decisions on the strategic role of IT in the organization*	**IT architecture** *Decisions on how technical capabilities are organized for business needs*	**IT investments** *Decisions on the amount, type and priority of IT investment*	**IT infrastructure** *Decisions on how IT services are shared*	**Application development** *Decisions on the management of application development and implementation*	**Outsourcing** *Decisions on IT outsourcing policy and management*
Specific stakeholder	P[7] L☐ U☐	P☐ L☐ U☐	P☐ L[6] U[3]	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐

IT decisions / **External stakeholder groups**	**IT strategic vision** *Decisions on the strategic role of IT in the organization*	**IT architecture** *Decisions on how technical capabilities are organized for business needs*	**IT investments** *Decisions on the amount, type and priority of IT investment*	**IT infrastructure** *Decisions on how IT services are shared*	**Application development** *Decisions on the management of application development and implementation*	**Outsourcing** *Decisions on IT outsourcing policy and management*
IT vendors	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐

Compliance, Audit & security Groups[4]	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐
Business customers	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐
Business suppliers	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐
Shareholders	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐
Competitors	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐
Trade associations	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐
Investors	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐
Local communities	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐
Other:	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐	P☐ L☐ U☐

[4] This group may include external auditors, government regulators, etc.

Section 3: External stakeholders stakes in IT as perceived by respondent

3.1 Among the external stakeholder groups who affect or are affected by your company's IT governance decisions, please indicate their specific stakes in IT?

External stakeholder groups	Specific stakes in IT
IT vendors	
Compliance, audit & security groups[1]	
Business customers	
Business suppliers	
shareholders	
competitors	

External stakeholder groups	Specific stakes in IT
Investors	
Local communities	
Other:	

Appendix B- Codification Grid: list of codes and their definitions

codes	definition
Scope of IT Governance	
TI decisions	Represents the major IT decision domains which relate to the key IT activities. These areas of decision focuses on: (1) IT strategic vision, (2) IT architecture management, (3) IT investment management, (4) IT infrastructure management, (5) IT applications development and implementation (6) policy of IT subcontracting.
Attributes of stakeholders prioritization	
Power	Perceived level of power exercised by an external stakeholder on IT decision-making.
Legitimacy	Refers to the perception of IT executives regarding the appropriateness of requests or claims of external stakeholders according to a given IT decision domain.
Urgency	Refers to the requirements of immediate attention to external stakeholder claims or requests in IT decision-making as perceived by IT executives.
External stakeholders Stakes in IT	
Interests	External stakeholders stakes in IT as perceived by IT executives.
External Stakeholders influence type	
Direct / indirect	Type of influence of the external stakeholder on the governance of IT decision domain.

CHAPITRE V - CONCLUSION DE LA THÈSE

Les technologies de l'information (TI) sont aujourd'hui omniprésentes dans toutes les sphères d'activités de l'organisation. Elles se trouvent au cœur de la relation entre les clients et les fournisseurs. Elles sont à la base de l'automatisation des processus d'affaires et font partie des initiatives de transformation stratégique de l'organisation. Les gestionnaires n'ont par conséquent plus le choix que d'accorder une attention particulière aux TI, compte tenu de leur rôle critique dans l'exécution de la stratégie d'affaires de l'organisation. Conscientes de ces enjeux, certaines organisations misent sur la mise en place d'une gouvernance des TI au même titre que la gouvernance des autres fonctions clés de l'organisation. La gouvernance des TI fait ainsi partie de la gouvernance de l'entreprise tout en étant appliquée au domaine des technologies de l'information (Weill & Ross, 2004). Elle repose plus particulièrement sur la mise en œuvre de bonnes pratiques à travers l'institution d'un leadership, de structures et processus organisationnelles pour assurer que les TI soutiennent et prolongent les stratégies et objectifs d'affaires de l'organisation (IT Governance Institute, 2003, 2008). Fondamentalement, une gouvernance des TI saine et efficace vise deux objectifs, soit (1) de limiter les risques liées aux TI et (2) de renforcer la création de la valeur des TI pour l'organisation.

La gouvernance des TI a longtemps été présentée comme un système de contrôle de gestion qui permet à l'organisation d'optimiser ses investissements TI à travers, notamment, la mise en place de mécanismes d'imputabilité sur les décisions TI. Cette perspective répond plus largement à la vague de réformes législatives (tel que l'acte Sarbanes-Oxley aux États-Unis et Basel II en Europe), mis en place dans le cadre de la gouvernance d'entreprise suite aux différents scandales financiers ayant marqué le monde des affaires au début des années 2000. Les sociétés cotées en bourse ont été depuis amenées à revoir leur structure de gouvernance pour répondre aux exigences de conformité et de transparence fiscale auprès de leurs actionnaires et dépositaires. Dans cette même vague de réformes, la gouvernance des TI s'est inscrite dans le cadre de la gouvernance d'entreprise et s'est fondée sur les mêmes principes de transparence et d'imputabilité pour contrôler les investissements technologiques de l'entreprise.

Quelques années plus tard, on a commencé à penser la gouvernance des TI en rapport avec la réalisation de la valeur des TI pour l'organisation. Ainsi, la gouvernance des TI est aujourd'hui présentée comme un moyen nécessaire à la réalisation de la valeur des TI pour l'organisation (IT Governance Institute, 2008). À ce titre, la plupart des recherches se sont intéressées à examiner l'impact de la gouvernance des TI sur l'alignement stratégique des TI avec la stratégie d'affaires (Beimborn, 2009; De Haes & Van Grembergen, 2009; Kuruzovich et al, 2012; Preston & Karahanna, 2009; Schlosser & Wagner, 2011), qui constitue un des déterminants de la création de la valeur des TI pour l'organisation (*IT business value*) (IT Governance Institute, 2003). Toutefois, très peu de recherches ont porté leur intérêt sur l'étude de la nature de la relation entre la gouvernance des TI et la performance organisationnelle. Un autre manquement à la recherche sur la gouvernance des TI est son rapport avec les parties prenantes externes à l'organisation. Si la gouvernance des TI constitue un moyen permettant la réalisation de la valeur des TI pour l'organisation, on peut penser que son efficacité passe aussi par la prise en compte des différentes parties prenantes à l'organisation qui sont exposées d'une façon ou d'une autre aux conséquences des investissements technologiques de cette dernière. Cette thèse vise donc à combler un manque de recherche sur ces deux thématiques dont le dénominateur commun serait l'apport de la gouvernance des TI à la réalisation de la valeur des TI pour l'organisation (*IT Business value*). Plus spécifiquement, les principaux objectifs de cette thèse furent de 1) clarifier la relation qui lie la gouvernance des TI à la performance organisationnelle, et 2) examiner l'importance accordée aux parties prenantes externes (*external stakeholders*) dans la gouvernance des TI.

Pour répondre au premier objectif de la thèse, une première étape a consisté à conduire une revue de littérature sur la gouvernance des TI, ce qui a permis d'identifier la limite des recherches ayant traitées de la gouvernance des TI en rapport avec la performance organisationnelle. Ce constat de la revue de la littérature a motivé le développement d'un cadre conceptuel qui se trouve basé sur une synthèse de la littérature et fondé conceptuellement sur la perspective des capacités dynamiques (Article #1). Ce cadre conceptuel se veut la proposition d'une explication théorique du lien entre la gouvernance des TI et la performance organisationnelle. Le modèle conceptuel proposé véhicule les idées suivantes:

- La gouvernance des TI peut être perçue comme une des capacités dynamiques de l'organisation dont les mécanismes (structures, processus et mécanismes relationnels) constituent le fondement.
- L'efficacité de la gouvernance des TI contribue au développement des capacités de gestion des TI de l'organisation et par conséquent détermine le niveau de sophistication de gestion des TI de l'organisation.
- La gouvernance des TI en tant que capacité dynamique conduit à une meilleure performance organisationnelle quand les capacités de gestion des TI sont développées en harmonie avec la stratégie d'affaires de l'organisation, positionnant ainsi l'alignement stratégique comme une conséquence de la sophistication de gestion des TI et un déterminant d'une meilleure performance organisationnelle.

L'illustration empirique de ce cadre conceptuel fut réalisée par la suite à travers la conduite d'une enquête quantitative auprès de 200 hauts dirigeants TI de grandes et moyennes organisations Nord Américaines (Article #2). Cinq mécanismes de gouvernance des TI ont été identifiés dans la littérature sur la base de leur efficacité tel que jugées par les recherches antérieures. Ils représentent tour à tour les trois dimensions de la gouvernance des TI :

- Comité de pilotage des TI et engagement de la haute direction dans les TI pour la dimension structure;
- Système de mesure de performance des TI et mesures de conformité des TI (*IT compliance*) pour la dimension processus;
- Utilisation de systèmes de communication sur les TI pour la dimension mécanismes relationnels.

Les données collectées ont permis de tester sept hypothèses de recherche en tout. Ces hypothèses se trouvent fondées sur les enseignements tirés du travail conceptuel de l'article #1. En résumé nos résultats supportent partiellement nos hypothèses de recherche. Globalement, ils indiquent que le recours à un système de mesure de performance d'entreprise constitue le mécanisme de gouvernance des TI qui affecte le plus la sophistication de gestion des TI de l'organisation, suivi par l'implication de la haute direction dans les TI. L'effet positif des autres mécanismes de gouvernance des TI sur la

sophistication de gestion des TI n'a pas été validé dans le cadre de cette recherche. Nos résultats ont par ailleurs montré que la sophistication de gestion des TI constitue un facteur important dans l'atteinte d'un meilleur alignement stratégique des TI et que l'alignement stratégique des TI avec la stratégie d'affaires conduit à une meilleure contribution des TI à la performance organisationnelle.

La gouvernance des TI aide les conseils d'administration, les gestionnaires et les autres décideurs des parties prenantes de l'organisation à maximiser le retour sur investissements des TI. Les recherches antérieures sur la gouvernance des TI ont essentiellement rapporté la place qu'occupent les parties prenantes internes à l'organisation dans la gouvernance des TI. Ceci nous amené à nous questionner sur la place qu'occupent les parties prenantes externes à l'organisation dans la gouvernance des TI. D'où le deuxième objectif de la thèse est d'examiner l'importance accordée aux parties prenantes externes (*external stakeholders*) dans la gouvernance des TI (Article #3). La théorie des parties prenantes et plus particulièrement le modèle d'identification et de saillance des parties prenantes de Mitchell, Agle, and Wood (1997), ainsi que la classification des domaines de décision TI de Grover, Henry, and Thatcher (2007) ont façonné théoriquement la réflexion sur cette question. Une enquête qualitative basée sur une série de douze entrevues auprès de hauts dirigeants TI de grandes et moyennes organisations au Canada a permis dans un premier temps de valider auprès de nos répondants une liste préliminaire de parties prenantes externes issue de la littérature pouvant être considérées comme parties prenantes à la gouvernance des TI. Nos résultats montrent que les vendeurs TI, les auditeurs externes, les clients d'affaires, les fournisseurs d'affaires, les investisseurs et actionnaires, les compétiteurs, les associations professionnelles, les partenaires d'affaires de type *joint venture* et les communautés locales font partie des parties prenantes à la gouvernance des TI compte tenu de l'impact qu'ils peuvent exercer, chacun à son niveau sur l'organisation des TI de l'entreprise. Nos répondants se sont prononcés par la suite sur la façon dont ces parties prenantes sont priorisées dans la gouvernance des TI. L'analyse des données collectées a permis de montrer que l'importance accordée aux parties prenantes externes dans la gouvernance des TI varie selon le domaine de décision TI. Par ailleurs, l'analyse révèle que les parties prenantes externes exercent une influence sur la gouvernance des TI

de l'organisation qui peut être directe ou indirecte selon leur rôle dans les activités TI ou leur rapport avec l'organisation dans son ensemble.

CONTRIBUTIONS THÉORIQUES

Les contributions théoriques de la thèse sont multiples. L'article #1 a permis de clarifier la nature de la relation qui lie la gouvernance des TI à la performance organisationnelle. Il vient ainsi combler le manque de recherches sur l'apport de la gouvernance des TI à la performance organisationnelle en développant un modèle conceptuel qui propose une explication de ce lien. De plus, l'article #1 aborde l'étude de la gouvernance des TI en empruntant un ancrage théorique qui n'a pas été exploré auparavant. En effet, les recherches passées sur la gouvernance des TI manquent généralement d'assises théoriques. Notre contribution à ce niveau est la proposition d'un ancrage théorique basé sur la perspective des capacités dynamiques pour conceptualiser le lien entre gouvernance des TI et performance organisationnelle et enrichir les recherches dans ce domaine d'étude. Le cadre conceptuel proposé explique comment se fait l'impact de la gouvernance des TI à la performance organisationnelle. À travers cinq propositions de recherche nous postulons que la gouvernance des TI en tant que capacité dynamique amène une performance organisationnelle mais que ce lien est indirect et se trouve influencé par l'effet médiateur de la sophistication de gestion des TI et de l'alignement stratégique observé dans l'organisation.

L'article #2 propose une illustration empirique de l'impact de la gouvernance des TI à la performance organisationnelle. Théoriquement, l'article #2 apporte un éclairage supplémentaire sur certains résultats en rapport avec l'efficacité des mécanismes de gouvernance des TI. Contrairement aux résultats passés, le modèle proposé a permis de tester l'efficacité de certains mécanismes de gouvernance des TI en évaluant leur effet direct sur les capacités de gestion des TI de l'organisation. D'un point de vue méthodologique, cet article vient combler le manque d'études quantitatives effectuées dans le domaine de gouvernance des TI en administrant une enquête quantitative à grande échelle. De plus, le développement et l'opérationnalisation au sein de l'article #2 d'un

modèle d'équations structurelles représente une contribution méthodologique importante car il permet d'enrichir les recherches passées qui sont majoritairement qualitatives.

À leur tour, les résultats de l'article #3 apporte des contributions théoriques très utiles. Cet article constitue en effet une première étude importante qui traite de la place qu'occupent les parties prenantes externes dans la gouvernance des TI. L'étude propose une conceptualisation riche de l'importance accordée aux parties prenantes externes dans la gouvernance des TI. Pour ce faire, nous avons combiné deux cadre théoriques, en l'occurrence la théorie des parties prenantes et plus particulièrement le modèle d'identification et de saillance des parties prenantes (Mitchell et al., 1997) et la classification des domaines de décision TI de Grover et al. (2007) pour traiter de la question à l'étude. Le recours à la théorie des parties prenantes est, à notre connaissance, une première dans les recherches sur la gouvernance des TI. Nous avons par ailleurs testé empiriquement la conceptualisation proposée. Les résultats ont permis d'identifier les parties prenantes externes qui sont considérées dans le cadre de la gouvernance des TI. Les résultats révèlent par ailleurs que la priorisation des demandes des parties prenantes externes dans la gouvernance des TI varie selon le domaine de décision des TI et que leur influence dans ce cadre peut être directe ou indirecte dépendamment de leur rôle dans les activités TI ou de la relation qu'elles entretiennent avec l'organisation dans son ensemble.

CONTRIBUTIONS PRATIQUES

Sur le plan pratique, l'article #1 propose un effort de synthèse et d'intégration de la recherche sur la gouvernance des TI et offre à travers le modèle conceptuel proposé des pistes de réflexion sur le rôle de la gouvernance des TI dans la création de la valeur des TI pour l'organisation. Ainsi, les enseignements derrière le model proposé incluent l'importance de la création d'un climat de collaboration entre les responsables d'affaires et TI pour la mise en œuvre de mécanismes de gouvernance des TI qui vont permettre une gestion efficace des TI et qui soit en harmonie avec les besoins d'affaires. Par ailleurs, le modèle conceptuel met en évidence l'importance de considérer la gouvernance des TI comme un processus dynamique et continu dans le temps. Ce processus doit être évalué

périodiquement pour lui permettre d'accomplir sa vocation de génération de la valeur des TI pour l'organisation.

Sur le plan pratique, les résultats empiriques de l'article #2 fournissent aux responsables de l'organisation des informations précises sur l'effet relatif de certains mécanismes de gouvernance des TI qui sont à l'étude dans le modèle en rapport avec leur efficacité en général. Par ailleurs, l'étude souligne l'importance de considérer la gouvernance des TI comme un moyen permettant le développement des capacités de gestion des TI de l'organisation. À ce titre, le choix des mécanismes de gouvernance des TI qui sont à la base doit être bien pensé. De plus, la sophistication de gestion des TI dans l'organisation devrait être perçue par les dirigeants de l'entreprise comme un indicateur de la réelle efficacité des mécanismes de gouvernance des TI mise en place dans l'organisation, en plus d'être un baromètre du niveau d'alignement stratégique des TI accompli. Par conséquent, les dirigeants TI et d'affaires doivent consolider leur effort pour le déploiement de mécanismes de gouvernance des TI initiateurs d'une meilleure sophistication de gestion des TI dans l'organisation et ultimement porteurs d'une meilleure contribution des TI à la performance organisationnelle.

L'article #3 quant à lui apporte un éclairage nouveau sur l'importance accordée aux parties prenantes externes dans la gouvernance des TI de l'organisation. Sur le plan pratique, cette recherche souligne l'importance de mettre en place des mesures réelles de gestion des parties prenantes externes dans la gouvernance des TI compte tenu de l'influence qu'elles peuvent exercer dans ce cadre. Ceci permettra aux dirigeants de l'entreprise de réduire l'impact négatif que peuvent avoir les parties externes sur la gestion de l'utilisation des TI de l'organisation d'une façon générale. Par ailleurs, une analyse réfléchie des parties prenantes externes permettra aux dirigeants de développer des stratégies de gestion qui sont adéquates pour chaque catégorie de parties prenantes dans l'intérêt de l'organisation et ainsi renforcer l'efficacité de la gouvernance des TI à générer de valeur des TI pour l'organisation.

LIMITES ET PISTES DE RECHERCHE FUTURES

Comme toute autre recherche, cette thèse présente des limites qui peuvent être perçues comme des opportunités pour des recherches futures. Dans l'article #2 de la thèse, l'illustration empirique de la gouvernance des TI s'est basée sur l'identification d'un nombre limité de mécanismes de gouvernance des TI qui ont été jugés comme efficaces par les recherches antérieures. De nouvelles recherches pourraient développer un construit multidimensionnel pour représenter de façon plus exhaustive le concept de gouvernance des TI. Par ailleurs, dans le cadre de la même étude nous avons collecté des données représentant différentes industries. Il serait intéressent de collecter les données dans une seule industrie et voir si les résultats pourraient changer en raison de l'effet de contingence du type d'industrie à l'étude. Finalement, nous avons examiné l'impact de la gouvernance des TI sur la sophistication de gestion des TI dans son ensemble, d'autres études pourraient étudier l'effet de la gouvernance des TI sur chacune de ses dimensions (i.e. Contrôle des TI, planification des TI, etc.) et ainsi déterminer les mécanismes qui sont les plus efficaces pour chacune des capacités de gestion des TI.

Le nombre de répondants présente une limite dans l'étude traitant de l'importance accordée aux parties prenantes externes dans la gouvernance des TI (l'article #3). De nouvelles recherches pourraient se concentrer sur le recrutement d'un plus grand nombre de répondants et évaluer son impact sur les résultats de l'étude. Dans le cadre de cette même étude, nous avons essentiellement considéré l'opinion des hauts dirigeants TI dans l'organisation, la considération de l'opinion des responsables d'affaires en plus de ceux en TI pourrait enrichir les résultats de l'étude. Par ailleurs, cette recherche a essentiellement examiné l'importance accordée aux parties prenantes externes dans la gouvernance des TI. De nouvelles études pourraient envisager l'étude de l'ensemble des parties prenantes de l'organisation (aussi bien internes qu'externes) et permettre une classification des parties prenantes à la gouvernance des TI en ayant une image plus holistiques des différents intervenants. Étant le caractère exploratoire de cette étude, de nouvelles recherches pourraient enrichir les résultats de cette étude par l'investigation d'autres méthodes de recherche telle que l'administration d'une étude quantitative à grande échelle. Finalement, l'étude de facteurs contextuels tels que le type d'industrie à laquelle appartient la partie

prenante pourrait apporter un éclairage supplémentaire quant à la gestion des parties prenantes externes dans la gouvernance des TI.

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