HEC Montréal

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KNOWING COMMUNITIES:

KNOWLEDGE SHARING AND CREATION

Par

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RÉSUMÉ

Cette thèse propose d'étendre la compréhension des activités qui permettent à une organisation de tirer profit de ces ressources intangibles que sont les connaissances. À travers quatre articles, j'explore différentes facettes des fondations du partage et de la création de connaissances sous l'angle des communautés. Dans un premier temps, je tente de marier le concept de communauté à la théorie des capacités dynamiques et ainsi d'élargir notre vision de ses microfondations au-delà du rôle des gestionnaires entrepreneurs. Le second article offre une étude empirique autour des activités de communautés dans le cadre du « front end » de l'innovation. Cet article cherche à illustrer comment celles-ci sont couplées et découplées aux activités du management et met en exergue le dilemme de gestion entre autonomie et contrôle que les communautés génèrent. Les troisième et quatrième articles s'intéressent pour leur part à la création et au développement d'une communauté à l'intérieur de bureaucraties professionnelles. À travers une analyse processuelle, le troisième article démontre que ces deux contextes – la communauté de pratique et la bureaucratie professionnelle – se marient difficilement ensemble et font naître des tensions pour les employés impliqués. Puis, le quatrième article est une étude de cas qui illustre la (re)consolidation d'une communauté d'infirmières dans le cadre d'une initiative de transfert intergénérationnel des connaissances. Ces deux articles démontrent que le niveau d'autonomie et de liberté dont jouissent les acteurs prenant part à ce type d'initiatives influence sa réussite. Cela contribue au courant de pensée plus organique et émergent du phénomène communautaire, à contrario de celui qui présente les communautés en tant qu'outil d'apprentissage organisationnel à la disposition du management.

Mots-clés : méthode d'observation; étude de cas; recherche longitudinale; recherche qualitative; communauté, capacités dynamiques, apprentissage, connaissance; innovation

ABSTRACT

This thesis aims to extend the understanding of activities that allow an organization to take advantage of knowledge-based assets. In four articles, I explore various aspects knowledge sharing and creation through the concept of community. First, I attempt to marry the concept of community to the dynamic capabilities framework and expand our vision of its microfoundations beyond the role of entrepreneurial managers. The second article provides empirical observations on the knowledge-based work of communities within the "front-end" of innovation. This article seeks to illustrate how community-based activities are coupled and decoupled from management and highlights the dilemma between autonomy and control that management faces with communities. The third and fourth articles for their part focus on the design and development of a community in professional bureaucracies. Through a process study, the third article shows that these two contexts – the community of practice and the professional bureaucracy – do not mesh well and create tensions for those employees who are also community of practice members. Then, the fourth article is a case-study that illustrates the development of a community of nurses taking part in intergenerational knowledge transfer. These last two articles show that the degree of autonomy and freedom of the actors involved in such community-based, but management-driven initiatives influence their performance. Such findings contribute to the organic, emergent view of communities, and suggest that communities should be regarded as a social phenomenon rather than an organizational learning tool.

Keywords: observation method; case study; longitudinal research; qualitative research; community; dynamic capabilities; learning; knowledge; innovation

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DÉDICACE

À mes parents.

REMERCIEMENTS

AVANT-PROPOS

Ma thèse comporte quatre articles qui ont été rédigés en collaboration avec Patrick Cohendet (articles 2 et 4), Laurent Simon (articles 2 et 4), Stefano Borzillo (article 2) et Louis-Étienne Dubois (article 4) de HEC Montréal. J'ai toutefois été le principal acteur à réaliser les différentes étapes de recherche, incluant la rédaction des articles. L'apport de Messieurs Cohendet, Simon, Borzillo et Dubois a essentiellement consisté à me superviser et/ou me soutenir durant ces différentes étapes : planification et développement de la méthodologie de recherche; revue de la littérature; cueillette, analyse et interprétation des données (ex. : accord inter-juges par consensus afin d'assurer de la validité); rédaction des articles; présentation lors de conférences arbitrées; révision des articles en fonction des commentaires obtenus lors des conférences; soumission des articles à différentes revues arbitrées; révision des articles et réponses à l'éditeur et aux évaluateurs des revues; etc. Ceux-ci ont également accordé leur permission d'intégrer les articles dans ma thèse.

Le premier article que je vous présente ici a principalement été développé lors de mes récents séjours de recherche à Haas School of Business, University of California, Berkeley, sous la supervision du Professeur David J. Teece. Il est à noter que cet article ne se veut pas une critique de la méta-théorie des capacités dynamiques, mais bien une proposition d'étendre l'étude de ses microfondations aux activités des communautés de connaissance. Il est prévu de le soumettre à la revue *Strategic Organization* (impact factor 2012 : 1.769), dans sa section intitulée *So!apbox Essays*. *Strategic Organization* est depuis quelques années une tribune où a cours un débat constructif autour de la méta-théorie des capacités dynamiques (ex. : Arend, et Bromiley, 2009; Helfat et Peteraf, 2009) et je crois que mon article intéressera l'un de ses

éditeurs, le Professeur Teppo Felin, qui est en quelque sorte à la source de ce débat (Abell, Felin et Foss, 2008; Felin et Foss 2005, 2006, 2009).

Le second article de ma thèse de doctorat est le résultat de certaines des activités du Centre de recherche et de transfert Mosaic (Bloch, 2012; Cohendet et Simon, 2007; Harvey et Simon, 2012; Simon, Guittard, Schenk et Harvey, 2010; Tremblay, 2008). Celles-ci ont permis la collecte d'un large éventail de données chez un partenaire industriel du Centre ainsi que de nombreuses réflexions avec certains de ses membres. Une version antérieure de l'article a été présentée à Séoul (Corée du Sud) lors du cinquième symposium ISPIM, qui s'est tenu en décembre 2012. L'article a ensuite été soumis à la revue *Research-Technology Management* (impact factor 2012 : 0.712) et, après deux évaluations, a été accepté pour publication.

En troisième lieu, je vous présente les retombées de mon implication dans un projet du Centre d'études en transformation des organisations (CETO) et du Pôle Santé. J'ai eu la chance de colliger des données originales dans le milieu de la santé en intégrant une plateforme de recherche sur le changement et l'innovation, pilotée par les Professeurs Jean-Louis Denis et Alain Rondeau. J'ai été invité à présenter cette étude à quelques occasions, dont lors d'un séminaire du Pôle Santé, de la conférence *Les systèmes de santé et de services sociaux à l'ère de l'économie créative* et de la conférence annuelle de l'Observatoire Compétences-Emplois. J'en ai aussi fait la présentation lors du 17e congrès de l'Association Internationale de Psychologie du Travail de Langue Française (AIPTLF), en juillet 2012 à Lyon (France), ce qui a donné lieu à une publication à l'intérieur de l'ouvrage *La question de la gestion des parcours professionnels en psychologie du travail* (publié aux Éditions l'Harmattan). Après deux révisions, l'article présenté dans ma thèse a quant à lui été publié dans la revue Journal of Knowledge Management (impact factor : 1.474), ce qui m'a valu le prix d'Étudiant-chercheur étoile du Fonds de

recherche sur la société et la culture (FQRSC). Selon Google Scholar, il a aujourd'hui été cité 12 fois.

Le quatrième article de ma thèse est le fruit d'autres activités réalisées au Centre Mosaic. Un projet de recherche-action a ouvert la voie vers un ensemble de données extrêmement riches. Cela a permis l'écriture d'un article, dont la première version a été présentée à Wellington (Nouvelle-Zélande) lors du quatrième symposium ISPIM, qui s'est tenu en décembre 2011. Une version révisée a ensuite été soumise à la revue *European Management Journal* (impact factor 2012 : 0.566), où l'article est aujourd'hui publié, encore une fois après quelques révisions. Selon Google Scholar, celui-ci a depuis été cité à deux occasions.

INTRODUCTION

Au cours des deux dernières décennies, l'intérêt général envers la notion de connaissance (sa gestion, son partage ainsi que sa création) en rapport aux organisations et à la création de valeur a augmenté de manière spectaculaire, comme en témoigne la forte croissance du nombre de publications scientifiques, professionnelles et populaires qui en traitent. Durant cette période, bon nombre d'avancées ont été effectuées dans ce domaine, et ce, tant d'un point de vue pratique que théorique. La question « Pourquoi partager? » ne mérite presque plus d'être posée et laisse place à une autre question : « Comment partager ? » ou « Comment faire en sorte que les employés partagent leurs connaissances et en créent de nouvelles ? » C'est à cette dernière question que je propose de répondre à travers ma thèse de doctorat et ce, en tirant profit de l'approche basée sur les communautés de connaissances.

Mise de l'avant par différents auteurs (par exemple, Barney, 1991; Wernerfelt, 1984; Amit and Schoemaker, 1993), la théorie basée sur les ressources de la firme (RBV) a jeté les bases des travaux futurs portant sur le management de la connaissance et l'apprentissage organisationnel en apportant un éclairage nouveau par rapport au modèle dominant en stratégie, c'est-à-dire celui des cinq forces de Porter (1980): le pouvoir de négociation des clients, le pouvoir de négociation des fournisseurs, la menace des produits ou services de substitution, la menace d'entrants potentiels sur le marché et l'intensité de la rivalité entre les concurrents. Porter met l'accent sur une analyse industrielle autour de ces cinq forces et souligne l'importance de choisir une « bonne » industrie et de s'y positionner de manière dominante dans la structure du marché visé afin de jouir d'un avantage concurrentiel durable. Il est vrai que selon le paradigme structure-comportement-performance de Mason (1949) et de Bain (1959), les caractéristiques structurelles du marché sont la principale source d'influence sur les comportements de

l'organisation et sa performance. Or, le monde a bien changé depuis la naissance de ces fondements de l'économie industrielle.

La conception conventionnelle de la concurrence a beaucoup évolué depuis la naissance du paradigme Mason-Bain (pour une analyse plus exhaustive de cette évolution, voir Teece, 2012). Les marchés ne sont plus aussi statiques qu'auparavant et affichent la plupart du temps un fort dynamisme : des nouveaux arrivants bouleversent aujourd'hui régulièrement les différentes structures de marché en place et obligent les organisations dominantes à demeurer actives dans leurs activités de développement de connaissances afin de dicter la voie ou bien de suivre la parade de changements auxquels elles sont confrontées. À cela s'ajoutent les effets de la semi-globalisation du monde dans lequel nous vivons, nous éloignant ainsi d'une ancienne réalité que certains ont définie de « West and the Rest », où les économies d'échelle ou d'envergure étaient alors gages de succès. Or, ce sont aujourd'hui les actifs intangibles et leur gestion qui offrent les fondations nécessaires aux organisations pour se différencier[1]. Qui plus est, le monde des affaires se lit de moins en moins par rapport aux différentes industries en place et davantage sur la base d'écosystèmes d'affaires, où plusieurs organisations travaillent de concert pour créer et capturer de la valeur sur des marchés variés. Cela met l'emphase sur la collaboration inter-organisationnelle et fait naître des enjeux de modularisation complexe entre de multiples interfaces, dépassant ainsi les enjeux d'intégration verticale auxquels le management traditionnel est habitué.

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[1] Bien loin de représenter une discontinuité brutale, ce changement progressif et lent saute aux yeux lorsque nous nous attardons à certaines analyses économiques. Par exemple, dès la fin des années 1960, la valeur du capital intangible (consacré à la création de connaissance – éducation, formation et R&D – et au capital humain – santé) dépasse celle du capital tangible (infrastructure physique et équipement, ressources naturelles, stocks) (Foray, 2009 : 21). L'OCDE souligne d'ailleurs que « grâce aux mutations technologiques et à une circulation de l'information plus intense, le savoir est considéré de plus en plus comme un déterminant majeur de la croissance économique et de l'innovation. » (2005: 91)

En contrepartie à l'approche de Porter, la RBV ne voit pas les organisations comme étant homogènes, mais plutôt comme des ensembles de ressources hétérogènes. Elle propose ainsi une stratégie basée sur une analyse interne – plutôt qu'externe – de l'organisation et insiste sur la nécessité pour celle-ci de miser sur des ressources qui sont d'une grande valeur, rares, difficilement imitables et non substituables. Cette approche a essuyé plusieurs critiques (ex. : Priem and Butler, 2001), la principale pointant son aspect statique : la RBV ne s'intéresse pas aux processus à partir desquels un avantage concurrentiel est créé et maintenu. Or, les activités prenant place autour des ressources de l'organisation ont indubitablement une influence capitale sur la performance de cette dernière.

Je propose ici d'étendre notre compréhension des activités qui permettent à une organisation de tirer profit de ces ressources intangibles que sont les connaissances. À travers quatre articles distincts, j'explore différentes facettes des fondations du partage et de la création de connaissances. Dans un **premier** temps, je parcours de manière théorique de quelle façon l'organisation arrive à développer des connaissances nouvelles en soutien au déploiement de capacités dynamiques[2] qui lui permettent de s'adapter à son environnement changeant ou de le modifier et de maintenir un avantage concurrentiel durable. Pour y arriver, j'emprunte une voie originale en réunissant les écrits de grands auteurs en stratégie et en management qui ont mis de l'avant des idées connexes, mais encore aujourd'hui sous-synthétisées: le cadre théorique des capacités dynamiques et le concept de communauté. Cet effort conceptuel a pour objectif d'élargir notre vision des microfondations des capacités dynamiques de l'organisation au-delà du rôle des gestionnaires entrepreneurs. Pour ce faire, je m'appuie principalement sur le rôle des

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[2] C'est en puisant dans le courant évolutionniste de l'économie que David J. Teece et ses collègues sont parvenus à donner un aspect dynamique à la RBV et qu'ils ont ainsi fait naître l'un des principaux cadres théoriques en stratégie, celui des capacités dynamiques.

communautés de savoir dans le développement de processus qui visent à tirer profit des connaissances à l'intérieur, mais aussi autour, de l'organisation.

Tirant les apprentissages de l'étude du fonctionnement d'une importante organisation créative dans l'industrie du jeu vidéo, le **second** article vise à mieux comprendre un phénomène essentiel et pourtant relativement peu étudié en amont des dynamiques d'innovation : la circulation des idées en organisation. Koen et ses collègues déconstruisent le processus d'innovation en trois phases distinctes : « the Fuzzy Front End » (FFE), « the New Product and Process Development » (NPPD) et « Commercialization » (2001). Chacune des différentes phases du processus d'innovation regroupe un ensemble d'enjeux particuliers qui appellent des méthodes, des procédures et des modes de gestion spécifiques. Mais un constat demeure : si les deux dernières phases (NPPD et commercialisation) ont fait l'objet de nombreux écrits, d'un ensemble de pratiques relativement bien maitrisées et d'un état d'avancement considérable des connaissances, la première phase (FFE), en revanche, reste très faiblement analysée et documentée. Par exemple, la plupart des entreprises maitrisent aujourd'hui de manière courante les techniques et procédures relatives à la seconde phase (NPPD) qui représente ordinairement l'introduction d'un mode de fonctionnement en gestion de projet, aussi appelé « stage-gate » (Cooper, 2001). De même, bon nombre d'organisations pratiquent maintenant de manière courante des techniques et des méthodes de management sophistiquées et éprouvées pour gérer la troisième phase (commercialisation).

Je décris ici à partir de différents ensemble de données les activités des communautés de savoir à travers le « front end » de l'innovation et tente d'illustrer comment celles-ci sont couplées et découplées aux activités du management. Dans ce contexte, l'étude des communautés de savoir permet de mieux contextualiser les éléments clés du « front end » de

l'innovation et leur gestion, ou non-gestion, sur le terrain. Je décris une série d'activités que j'appelle ici « scripted » ou « unscripted » par le management et interne ou externe à l'organisation pour finalement offrir une illustration du travail des communautés de savoir dans les activités de génération et de développement des idées.

À travers une étude de cas, le **troisième** article s'intéresse au design et au développement d'une communauté de pratique pilotée dans une bureaucratie professionnelle. La vision des communautés de pratique a récemment évolué, partant d'entités plutôt organiques et émergentes vers des groupes qui peuvent être créés intentionnellement et pilotés par l'organisation. Elles sont aujourd'hui fréquemment présentées en tant que panacée aux enjeux de partage et de création de connaissances et en tant que base essentielle à l'innovation continue en organisation. Toutefois, la démonstration que des organisations ont réussi à relever le défi de créer et développer des communautés de pratique pilotées en leur sein n'est pas encore tout à fait convaincante.

Il s'agit ici d'une des rares recherches qui adoptent une approche processuelle (16 mois) pour étudier le design et le développement d'une communauté de pratique pilotée par la hiérarchie. Une collecte de données extrêmement riches a été rendue possible grâce aux périodes d'observation tout au long du processus de design et de développement de la communauté de pratique, de l'analyse documentaire ainsi que des 27 entrevues au début et à la fin du processus, auprès de 17 répondants différents. Ce type d'étude était fondamental, car la littérature scientifique récente sur ce phénomène organisationnel s'est largement concentrée autour d'approches plus quantitatives, où l'utilisation d'un questionnaire à un moment donné dans le processus de développement d'une communauté de pratique représente le principal moyen de collecte de données. Cela ne permettait pas de comprendre l'évolution d'une communauté de

pratique à partir de la perspective des principaux intéressés, c'est-à-dire les employés qui y prennent part. La prise en compte du contexte en place et du point de vue des acteurs au cœur de cette initiative, tout cela dans une perspective dynamique, ainsi que le résultat de celle-ci rendent cette contribution intéressante tant d'un point de vue théorique que pratique.

À travers l'analyse processuelle de l'initiative en question, l'étude longitudinale que je présente ici démontre que ces deux contextes – la communauté de pratique et la bureaucratie professionnelle – se marient difficilement ensemble et font plutôt naître des tensions pour les employés qui sont aussi membres de la communauté de pratique. Cela signifie que l'approche communautaire de la gestion des connaissances ne sert peut-être pas tous les types d'organisations. Nos résultats nous amènent ainsi à reconsidérer les communautés de pratique en organisation et une critique de l'appréciation générale de cette approche est formulée. Cela soulève par ailleurs la question à savoir si, plutôt que de représenter un outil d'apprentissage organisationnel, les communautés de pratique ne représentent pas en fait un phénomène social émergent.

Puis, en dernier lieu, à travers le **quatrième** article de ma thèse, je développe une analyse systématique d'une stratégie novatrice en matière de transfert intergénérationnel des connaissances dans une organisation dite « knowledge intensive ». Les populations sont vieillissantes et une grande proportion des travailleurs est sur le point de prendre leur retraite. Selon Statistiques Canada (2010), la proportion de personnes âgées de 65 ans et plus représentera entre 23% et 25% de la population en 2036, en comparaison à 14 pour cent en 2009. Ces départs à la retraite sont inévitablement accompagnés par une perte considérable de connaissances. Afin de combattre les dangers d'amnésie corporative, le transfert intergénérationnel des connaissances devient une question de survie. Toutefois, les exemples d'initiative fructueuse sont rares et

seulement une organisation sur cinq possède un plan de transfert intergénérationnel des connaissances (Conference Board of Canada, 2008). L'étude d'une initiative reconnue (Pratique exemplaire selon Agrément Canada et Prix AQESSS 2011) qui a permis la (re)consolidation d'une communauté d'infirmières devrait inspirer d'autres organisations en offrant une réponse à la nécessité de redéfinir le travail d'employés en fin de carrière, tout en encourageant la réflexion et les interactions sociales avec les plus jeunes.

Une méthodologie d'étude de cas a été adoptée pour étudier les activités de transfert intergénérationnel des connaissances au Centre de santé et de services sociaux La Pommeraie. Des données qualitatives ont été recueillies sur une période d'environ un an à partir d'observation non participante, d'entrevues de groupe et individuelles et d'analyse documentaire. Une analyse thématique des données a été effectuée concurremment avec leur collecte. Cela m'a amené à présenter deux modèles qui fournissent une base de référence pour réussir le transfert des connaissances. En fait, alors qu'un consensus existe dans la littérature sur deux dimensions de la connaissance – explicite et tacite – les études suggèrent que le transfert de connaissances tacites est plus difficile. La croyance dominante demeure que la connaissance peut être codifiée et manipulée pour mener à son transfert et ne s'intéresse pas aux interactions entre les individus. La présente étude permet de mieux comprendre comment des relations de proximité peuvent être créées entre des individus de différentes générations et comment les interactions qui en découlent permettent le transfert de connaissances tacites. Deux modèles de transfert intergénérationnel des connaissances sont présentés: le modèle source-destinataire et celui de l'échange mutuel. Très peu de travaux empiriques ont été publiés sur le développement d'initiatives de transfert intergénérationnel des connaissances et cette étude contribue à l'avancement des connaissances en illustrant notamment l'importance des variables de motivation, d'inspiration et de

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responsabilisation des acteurs au cœur d'un tel processus. Ces résultats et les modèles présentés dans l'article pourront servir pour la recherche future.

Dans son ensemble, cette thèse est diverse dans sa forme, puisqu'elle comprend un article à saveur théorique et trois études empiriques dans des contextes distincts, mais toujours autour d'enjeux de partage et de création de connaissances sous le concept de communauté. Elle s'inscrit dans la lignée des travaux de mes directeurs de thèse, les Professeurs Patrick Cohendet et Stefano Borzillo, pour qui les organisations doivent d'ores et déjà agir en tant que processeur de connaissances en mode proactif par rapport à leur environnement. Alors que la plupart des théories économiques ont traditionnellement perçu les organisations en tant que processeur d'information (en mode réactif), c'est-à-dire principalement intéressées par la prise des décisions et la gestion des transactions, elles doivent être révisées. Les organisations représentent aujourd'hui des institutions où des connaissances sont continuellement développées, affinées, mises à jour et protégées à travers un processus d'apprentissage. J'espère ici contribuer à ce courant de pensée du management.

CHAPTER ONE – FIRST PAPER

THE DYNAMIC CAPABILITIES FRAMEWORK MEETS THE CONCEPT OF

COMMUNITY: THE RECOGNITION OF BOUNDARY SPANNING AS A

MICROFOUNDATION OF SUSTAINABLE COMPETITIVE ADVANTAGE

Abstract: In this essay, I discuss the direction that has been given to the research that is pursued on the microfoundations of dynamic capabilities and its emphasis on entrepreneurial management. I attempt to build bridges between organizational theory and strategic management by drawing upon the literature on the concept of community in increasing the knowledge-based capabilities of organizations. More specifically, three processes have been identified by Teece (2007) as the foundations of dynamic capabilities: sensing opportunities, seizing them, and transforming the business organization to profit from these opportunities. Those processes are said to embody systems, structures and procedures. They cover a large range of formal organizing principles but fail to account for the more shadowy activities that take place in organizations such as the ones that are community-based. I attempt to synthesize the latter within these processes and in so doing I expose the significance of boundary spanning as part of the microfoundations of sustainable competitive advantage.

1.1   INTRODUCTION

Over the last two decades, the dynamic capabilities framework (DCF) has moved to the forefront of strategic management research (Di Stefano, Peteraf and Verona, 2010). Yet, it remains disproportionately theoretical, lacking clarity and empirical grounding (Ambrosini and Bowman, 2009; Arend and Bromiley, 2009; Williamson, 1999; Zahra, Sapienza, and Davidsson, 2006). Scholars nevertheless plead that the theory is still in its infancy and that more time and new research should allow it to gain full acceptance (Helfat and Peteraf, 2009). I for one agree with such assessment – the DCF has allowed scholars and practitioners to gain a better helicopter view of how organizations gain and undergird sustainable competitive advantage. More empirical research to uncover its microfoundations and to understand how they interplay with organization performance should help explicit the DCF significance. For instance, what's behind the set of processes of sensing (identification and assessment of an opportunity), seizing (mobilization of resources to address an opportunity and to capture value from doing so), and transforming (continuous alignment of tangible and intangible assets) that the DCF puts forward (Teece, 2007) remains for the most part a black box that needs to be unpacked (Teece, 2012). However, I am concerned with the actors and activities on which such empirical research has so far focused on.

Recent scholarship stresses the need to uncover the microfoundations of the capabilities concept in general and of the DCF in particular, and insist on the need for more micro level analysis to explain the origins of capabilities (e.g., Abell, Felin, and Foss, 2008; Easterby-Smith, Lyles, and Peteraf, 2009, Felin and Foss, 2005, 2006, 2009). According to Felin and colleagues (e.g., Felin and Hesterly, 2007; Felin and Foss, 2009), we need to build microfoundations rooted in individual action and interaction. So far, most of the emphasis has been put on the role of top

managers, and more particularly on their entrepreneurial attributes (e.g., Augier and Teece, 2008; Adner and Helfat, 2003; Bergen and Peteraf, 2002; Sirmon and Hitt, 2009; Teece, 2007; 2009) or cognitive abilities (e.g., Gavetti, 2005; Helfat et al., 2007; Kor and Mesko, 2013; Salvato, 2009; Tripsas and Gavetti, 2000). Research has focused on how the latter shape the evolutionary fitness of their organization by sensing opportunities, seizing them, and orchestrating assets to address rapidly changing environments. However, I believe that what phenomena are regarded and hence studied as microfoundations of DC need to cover a wider range of organizational activities. They should cover more than one layer of organizational life in order to reflect the DCF proposition.

The DCF definition has always been intentionally general, ranging from new product development to post-acquisition integration (Helfat et al., 2007) and the processes of sensing, seizing and transforming identified by Teece (2007) cover larger ground than what has been deemed as entrepreneurial management. Entrepreneurial management may well be an important part of the microfoundations of dynamic capabilities but I argue that it is not the only one of importance or value. In fact, I believe that we may miss a great deal of what the DCF actually represents if we continue this route because the sole focus on entrepreneurial management may actually distort our understanding of organizational life. As advocated by Hodgson (2012), I believe that social relations need to be front and center of such research and I argue that the latter are best represented through the concept of community.

In this essay, I discuss the direction that has been given to the research that is pursued on the microfoundations of the DCF. Then, as suggested by Durand (2012), I attempt to build bridges between organizational theory and strategic management by drawing upon the literature on the concept of community in increasing the knowledge-based capabilities of organizations. As Brown and Duguid suggest, an organization can be viewed as follows:

a collective of communities, not simply of individuals, in which enacting experiments are legitimate, [and where] separate community perspectives can be amplified by interchanges among communities. Out of this friction of competing ideas can come the sort of improvisational sparks necessary for igniting organizational innovation. Thus large organizations, reflectively structured, are perhaps particularly well positioned to be highly innovative and to deal with discontinuities. If their internal communities have a reasonable degree of autonomy and independence from the dominant world view, large organizations might actually accelerate innovation. (1991: 54)

Despite similar themes, the concept of community has been somewhat ignored within the field of strategic management, and more particularly in regards to the stream of dynamic capabilities. I believe however that examining the microfoundations of the DCF without considering the effects of communities will render any analyses incomplete – it leads me to expose the significance of a microfoundation that was, thus far, rather obscured in the DCF: boundary spanning[3].

1.2   THEN AND NOW: A BRIEF OUTLOOK ON THE DCF

The DCF was originally conceptualized two decades ago by Teece and his colleagues (e.g., Teece, Pisano and Shuen, 1990; 1997; Teece and Pisano, 1994), who then built on the resource-based view of the firm (RBV) (Barney, 1991; Wernerfelt, 1984). The latter stemmed from Penrose's work (1959) and stressed the significance of resources that are valuable, rare, inimitable, and non-substitutable in explicating an organization's performance. It has however

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[3] The terms boundary spanners (e.g., Cross and Prusak, 2002; Levina and Vaast, 2005; Tushman, 1977; Tushman and Scanlan, 1981b), gatekeepers (e.g., Allen and Cohen, 1969; Allen, 1977; Katz and Tushman, 1980; Macdonald and Williams, 1994), bridges (e.g., Burt, 1992; Valente and Fujimoto, 2010), knowledge brokers (e.g., Hargadon and Sutton, 1997), etc. have been used to described a similar set of behaviors. Although some scholars make a theoretical distinction between the latter (e.g., Fleming, Mingo, and Chen, 2007; Fleming and Waguespack, 2007), they remain empirically close to each other. I also believe that these roles are intertwined in everyday practice and therefore, I do not focus on such distinctions here and use the umbrella term "boundary spanners".

been heavily criticized for its overly static nature (e.g., Porter, 1991; 1996; Priem and Butler, 2001), criticisms to which the DCF provided an answer to thanks to its anchorage in evolutionary economics (Nelson and Winter, 1982; Schumpeter, 1961).

Whereas the RBV could not explicate the processes by which competitive advantage is gained and maintained over time, the DCF introduced a processual dimension that tackles the latter challenge by emphasizing the development and renewal of resources that are seen to be organization-specific (mostly intangible) assets that are difficult to imitate or otherwise replicate. It confronted the dominant paradigm in the field of strategic management – the competitive forces approach developed by Porter (1980), a model that is rooted in the structure-conduct-performance paradigm of industrial organization economics (Mason, 1957; Bain, 1959) – and it moved the locus of attention from market structure to the organization's ability to integrate, build, and reconfigure internal and external competencies (Teece, Pisano and Shuen, 1997: 517).

The DCF aims to explain the sources of an organization's competitive advantage over time by focusing on its capacity to predict and act upon change. It emphasizes the appropriate, timeless, and efficient creation, extension or modification of the organization's resource base and the achievement of evolutionary fitness through adaptation to and/or shaping of the external environment (Helfat et al., 2007; Winter, 2003). More specifically, the DCF is used as a meta-process that envelops three processes: (1) sensing opportunities, (2) seizing them, and (3) transforming the business organization to profit from those opportunities (Teece, 2007).

1.2.1   Entrepreneurial management and the DCF

Based on recent advances on the DCF (e.g., Augier and Teece, 2008; Teece, 2007, 2009), it is assumed that entrepreneurial managers play the principal role in actively sensing and seizing

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opportunities as well as transforming the resources/assets of the organization in order to gain and undergird sustainable competitive advantage. Also termed dynamic managerial capabilities, entrepreneurial management is seen as the key mechanism to achieve congruence between the organization's competencies and changing environmental conditions (Adner and Helfat, 2003; Bergen and Peteraf, 2002; Sirmon and Hitt, 2009). According to DC scholars (e.g., Helfat et al., 2007; Teece, 2007), sensing new opportunities is a scanning, creation, learning, and interpretive activity, which rests upon analytical systems that entrepreneurial managers can gain insights from; seizing entails commercialization and investment decisions that entrepreneurial managers make based on individual, methodical activities; and transforming involves decisions that align or realign the governance of the organization and the coordination of activities through asset orchestration, where entrepreneurial managers manipulate resources in order to generate rents.

DC scholars appear to depict entrepreneurial managers as corporate superheroes who can single-handedly turn their whole organization around thanks to sizzling cognitive abilities – the role of cognition has been emphasized in works on the DCF and entrepreneurial management (e.g., Gavetti, 2005; Helfat et al., 2007; Kor and Mesko, 2013; Salvato, 2009; Tripsas and Gavetti, 2000). It is posited that despite the highly turbulent environment in which entrepreneurial managers find themselves – the rate of change and uncertainty with technologies, competitors, product-market demand, etc. – they end up making the right strategic decisions that consider multiple factors and short- and long-term perspectives. According to DC scholars, entrepreneurial managers figure out the next big opportunity and how to address it and they achieve the right value-enhancing orchestration of assets inside, between, and amongst organizations within their business ecosystem. They are said to play the critical role of "both transforming [their organization] and shaping the ecosystem through sui generis strategic acts"

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(Teece, 2012: 1395); everything that relates to the creation and subsequent use of dynamic capabilities appears to rest upon entrepreneurial managers' ability to "productively change existing routines or resource configurations, [to undertake such change, and to implement these changes]" (Zahra, Sapienza, and Davidsson, 2006: 918).

I believe that the assessment of the DCF's microfoundations through managers' neural networks is rather reductionist when we consider the complexity of contemporary economic activities and the organizations that we study. The latter tend to become increasingly specialized (Teece, 1998) and split into various subspecialties (Adler, Kwon, and Heckscher, 2008) and more and more work practices are hazily defined or difficult to discern, with increasingly ambiguous outputs (Alvesson, 1993; 1995; Cross, Borgatti, and Parker, 2003; Nardi and Engeström, 1999; Suchman, 1995). The world is moving faster than ever before, and the stakes – financial, social, environmental, political, ethical, etc. – are more numerous and complex than ever. It is difficult for anyone to keep pace, with risk of information overload and lack of specialized knowledge to fully understand the many issues one must act upon (Eppler and Mengis, 2004). Managers thus repeatedly face complex problem-solving situations that offer a superabundance of information and alternatives, with no clear-cut path to a solution.

Organization theorists (e.g., Barley, 1996) have long highlighted that traditional hierarchy may very well not be the best mode of organizing, as the authority of expertise may no longer coincide with authority of position. Such reality is also emphasized in recent work by strategy scholars who posit that better access to information forces organizations to do away with traditional hierarchy and control (Altman, Nagle, and Tushman, 2013). It is therefore rather naïve to believe that an organization's sustainable competitive advantage entirely rests upon the cognitive abilities of a select few: "Organizations resemble garbage cans more than neat

pyramids. Reason is not omniscient – it is developmental, experiential and embedded in social practices" (Tsoukas and Dooley, 2011: 730). Accordingly, I believe that the concept of community that has been applied in organizational theory over the past thirty years has to be taken into consideration when we look at the microfoundations of dynamic capabilities.

1.3   ORGANIZATIONS AS COLLECTIVES OF COMMUNITIES

Communities of practitioners (Constant 1984; 1987), Communities of practitioners (Constant 1984; 1987), epistemic communities (Cohendet and Meyer-Krahmer 2001; Cowan et al. 2000); communities of practice (Brown and Duguid 1991, 2001; Lave and Wenger 1991; Wenger 1998), communities of specialists (Cohendet and Simon 2007); communities of knowing (Boland and Tenkasi 1995), knowledge-based communities (David and Foray 2003), learning communities (Bogenrieder and Nooteboom 2004), occupational communities (van Maanen and Barley, 1984; Beckhy 2003), user communities (Baldwin and von Hippel, 2011; Franke and Shah, 2003; von Hippel 1986, 2001), online communities (Faraj and Johnson, 2011) and so on… all of them are terms that have been used to describe entities where people rely on repeated and continuous interaction and actively exchange and accumulate knowledge in a given domain. They are "bound together by common values, interests, and a sense of tradition, share bonds of solidarity or mutual regard and partake of a communal way of life that contrasts in idyllic ways with the competition, individualism, and rational calculation of self-interest associated with persons organized on utilitarian principles" (van Maanen and Barley, 1984). Communities represent groups of high-steel ironworkers (Haas, 1977), police officers (Van Maanen, 1973), kitesurfers (von Hippel, 2005), photocopier repair technicians (Orr, 1991), radiologists (Barley,

1986), locomotive engineers (Gamst, 1980), claims processors (Wenger, 1998), etc. – to some degree, we all become part of various communities throughout our life[4].

Thanks to low cognitive distance (Nooteboom, 2000) and shared social identity (van Maanen and Barley, 1984), members of a same community do not need to invest large amounts of time and energy in detailed explanations or in trust-building when exchanging and accumulating knowledge. They can pick up each other's half-finished sentences and partial insights and take advantage of an easy formation of collective knowledge, shared sense-making, and a distributed understanding of the appropriateness of their behaviors. Indeed, a community shapes social conventions (i.e., set of values, beliefs, norms, and perspectives) through its members' socialization practices (Lave and Wenger, 1991). The latter help build a mutually shared system of codes (Peirce, 1974; Barthes, 1964), and more generally, similar frames of reference (Holzner, 1968), or "thought worlds" (Dougherty, 1992), that stem from common expertise and/or joint experience. The setting of such "interpretation systems" gives a specific meaning to words, objects, events, or phenomena (Daft and Weick, 1984) and ensures that a community's members display similarities in the ways they perceive, interpret, understand, and evaluate the world. It makes their dialogue productive in terms of knowledge creation (Tsoukas,

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[4] According to Håkanson,, "identities are never singular. Individuals belong to and identify with multiple [communities], both occupational and private ones. Occupational identities themselves are often complex. Notably, individuals tend to identify both with their professions and with the firms (or other organizations) where they are employed, but occupational identities may also be linked to work groups, functional departments, or geographical sites. In interaction with others, individuals situationally select the frame of reference appropriate to the group and structural context at hand, while reconciling their actions with other such frames which are also part of their personal history and identity" (2010: 1811).

2009). At the same time, interpretation systems create intersubjective boundaries that inevitably include or exclude people from the community.

The intersubjective boundaries set by interpretation systems clarify the roles individuals play within complex organizations (collectives of communities) and facilitate knowledge creation within a specific domain. At the same time, it increases network closure, which facilitates the development of reciprocal expectations about the members' trustworthiness and inspires some sort of social insurance which enhances the quality of their interactions (Chua, Ingram, and Morriw, 2008; Ferrin, Dirks, and Shah, 2006). The denser the networks in a relationship, the more the individuals in this relationship are willing to invest time and energy to transferring knowledge between one another (Cross and Sproull, 2004), and the better the quality of their interactions (Cross and Cummings, 2004; Hansen, 1999; Reagans and McEvily, 2003). For these reasons, the concept of community has provided a form of coordination that has gained ground as the centralized, rationalized bureaucracy could only provide an incomplete picture of contemporary economic activities, in which the primary driver of value is knowledge instead of physical inputs (Foray, 2004; Powell and Snellman, 2004). A group of autonomous individuals interacting in a community and whose relationships are based on shared social conventions instead of authority or price competition may represent the best option for knowledge growth (Adler and Heckscher, 2006; Adler, Kwon, and Heckscher, 2008).

Communities are considered by many scholars as the principal source of knowledge in organizations (e.g., Amin and Cohendet, 2004). However, research has shown that redundant ties between the same actors decrease the chances of coming across new knowledge that could enable learning and creativity (Burt, 2002; Perry-Smith, 2006). Indeed, communities can also be the source of inertia when they get stuck in a rut due to self-deluding/self-reinforcing social

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conventions (e.g., Garud and Rappa, 1994). It is spanning communities and taking advantage of structural holes that provide the greatest opportunities for creativity and innovation (Burt, 2004). As Drazin, Glynn, and Kazanjian suggest, "creative processes at the organizational level may not simply aggregate from individual or group efforts; rather, they may emerge from a process of negotiating multiple and potentially competing interests between different communities" (1999: 291). Innovation thus lies at the interstices of different communities (Carlile, 2002; Dougherty, 1992; Leonard-Barton, 1995).

In other words, communities represent the best option for knowledge growth in one specific domain but need to break from isolation in order to overcome the risk of inertia that stems from the establishment of strong social conventions in order to reach their innovative potential. Organizations act as vehicles for the latter to occur by facilitating the integration of knowledge across such groups (Grant, 1996a, b; Nickerson and Zenger, 2004).

The concept of community has been used extensively in organization science; communities have been shown to have a great impact on an organization's performance (O'Mahony and Lakhani, 2011). Scholars have studied the knowledge-sharing and sense-making capacities of communities located inside an organization (e.g., Bechky, 2003a,b; Boland and Tenkasi, 1995; Brown and Duguid, 1991, 2001; Adler and Heckscher, 2006; Van Maanen and Barley, 1984; Wenger, 1998) as well as the innovative attributes associated with community-based initiatives that go beyond one organization's boundaries (Hargrave and van de Ven, 2006; Kreiner and Schultz, 1993; Lakhani and Panetta, 2007; Rosenkopf and Tushman, 1998 Rosenkopf, Metiu, and George, 2001; Tushman and Rosenkopf, 1992; von Hippel, 2005). Research on the concept of community demonstrates that communities matter and leads me to believe that it is inappropriate to investigate innovation and sustainable competitive advantage

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without taking them into consideration. Yet, works on the microfoundations of DC appear to lack the impetus to move away from the old-fashioned, manager-driven idea of organizations, and tend to overlook the important roles played by communities.

1.4   A LOOK AT THE DCF'S PROCESSES FROM A COMMUNITY STANDPOINT

Three processes have been identified by Teece (2007) as the foundations of the DCF: sensing opportunities, seizing them, and transforming the business organization to profit from these opportunities. Those processes are said to embody systems, structures and procedures. They cover a large range of formal organizing principles but fail to account for the more shadowy activities that take place in organizations such as the ones that are community-based. I attempt to synthesize the latter within the DCF's processes in this section of the essay and in so doing; I expose the significance of a microfoundation that was, thus far, rather obscured in the DCF: boundary spanning.

1.4.1   Sensing: the creative power of communities

For a week-end in 2011, Google combined the minds of 80 former Muslim extremists, neo-Nazis, U.S. gang members and other former radicals with those of 120 thinkers, activists, philanthropists and business leaders to explore the reasons why some people draw to extremist movements and why some of them leave (McDuffee, 2011). This may seem trivial, but it does give some indication on how innovative organizations go about sensing new opportunities.

> It is hardly possible to overrate the value…of placing human beings in contact with persons dissimilar to themselves, and with modes of thought and action unlike those with which they are familiar….Such communication has always been, and is peculiarly in the present age, one of the primary sources of progress. (Swedberg, 1990: 3)

This famous quote from John Stuart Mill places the accent on what happens at the boundaries between communities. Burt (1992; 2000; 2002) would call these spaces "structural holes", where two separate communities possess non-redundant information. It means that creation in terms of new ideas and insights is fostered through the original combination and recombination of knowledge and experience from different sources (Geroski and Mazzucato, 2002; Leonard-Barton, 1995; Styhre and Sundgren, 2005). For instance, Hargadon insists on the case of TiVo's digital recorder: "TiVo's digital video recorder – [which was] threatening to upset the television industry – is an innovative combination of video recorder, TV Guide, and personal computer (complete with motherboard, hard drive, and Linux operating system)" (2003: 33).

Organizations are more and more aware of the power of blending knowledge that stem from various communities. A quick look at Samsung's open positions in its American research labs serves as a good example. The organization is currently (July 2014) looking to fill positions with all sorts of engineering expertise (software, mechanical, transducer, mobile user interaction, security, build, database, algorithm, etc.), designers (interaction, audio, visual), developers (business, software, open source), researchers (user and privacy), mobile technology analysts, product managers, computer architects, business strategists, biosensing experts, data scientists, and anthropologists. Quite diversified, isn't it? Another example is Microsoft: the well-known computer software and hardware company is said to be the second-largest employer of anthropologists in the world (Wood, 2013)!

It is important that communities set their boundaries in order to develop knowledge that is homogeneous within their group. But it is also crucial that bridges are built between communities. Take data scientists and anthropologists, for instance. Big data has recently been identified as containing a sea of opportunities for organizations to sense. However, what proxies

should be used in order to gain earlier access to insights is no given. On the other hand, finding emergent synergies between ethnographic approaches and big data may very well be how organizations can detect trends and emerging realities. Obviously, due to the different thought-worlds that are constructed through the practice of each community (Boland and Tenkasi, 1995; Dougherty, 1992), this observation points to other organizational challenges.

It is the organization of diverse perspectives that provides the real potential for sensing new opportunities (Boland and Tenkasi 1995). In other words, diversity is not a panacea; the key is to recognize when communities' diverse knowledge should be assembled together. Indeed, knowledge creation requires a diverse and complementary knowledge base (Boschma, 2005; Boschma and Frenken, 2010; Cohendet and Llerena, 1997; Nooteboom, 2000; Nooteboom et al., 2007); diverse because it is the sources of new knowledge that give rise to new ideas, leading to creative impulses, which are uninteresting if they are identical to those of the other actors, but also complementary because expert individuals from completely different fields face serious communication problems when they interact together. Thus, a certain cognitive distance increases the potential for knowledge creation, although it simultaneously limits the individuals' absorptive capacity (Cohen and Levinthal, 1990). A tradeoff is then needed between cognitive distance, for the sake of novelty, and cognitive proximity, for the sake of efficient absorption. After all, knowledge is useless if it is incomprehensible, but it is equally useless if it is not new. Boundary spanning activities allow organizations to resolve this dilemma by building the link between various knowledge sources, playing the role of middlemen or intermediaries between communities.

The individuals who find themselves at the interstices of different communities (inside or outside the organization) and span their boundaries are able to integrate knowledge from one

community as well as translate and disseminate it so that it resonates to other communities. Leif Edvinsson's role at Skandia is a good example of boundary spanning: "[he] was a "knowledge activist", connecting and activating internal and external intelligence experts from all over the world" (von Krogh, Ichijo, and Nonaka, 2000: 149).

The boundary spanning role is based on polyvalence and circulation competencies (Cross and Prusak, 2002) and breaks communities away from isolation through reflective reframing (Hargadon and Bechky, 2006). In so doing, boundary spanners leverage communities to source new knowledge, which is not readily available via market exchanges (Gulati, 1999; Gulati, Nohria, and Zaheer, 2000) and therefore provides the creative slack necessary for organizations to sustain their innovative power (Cohendet and Simon, 2007). Lawyers have been shown to play such roles in regions like the Silicon Valley (Saxenian, 1994) as well as star scientists within the biotechnology industry (Rothaermel and Hess, 2007), private firms' employees assigned to work in the free and open source software community (Dahlander and Wallin, 2006), mid-level managers involved in technical committees regrouping cellular service providers and equipment manufacturers (Rosenkopf, Metiu, and George, 2001), and individuals emerging as open innovation community leaders by taking part in community events about internet engineering (Fleming and Waguespack, 2007).

1.4.2   Seizing: the legitimating influence and problem-solving abilities of communities

Once an opportunity has been sensed, it needs to be seized through a strategy to reach the market (product and service innovations) or an implementation strategy (process innovations). Resources need to be garnered with the explicit focus of, for instance, in the case of product

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innovation, developing a new product as well as designing a business model. Crawford (1980) would say that the opportunity is held up the organization's innovation charter.

Such situations bring up a conflict that is triggered among the organization's constituents because there are always numerous ways to use limited resources. In fact, research shows how difficult it can be to move resources away from the most profitable markets that allow satisfying the most profitable customers as well as investors by earning strong margins (Christensen, 1997; Christensen and Raynor, 2003; Kaplan and Tripsas, 2008). Such a process should be seen as both emergent and collective; the decisions are intrinsically biased (Das and Teng, 1999; Schwenk, 1984). They are based on processes of formation and revision of beliefs – decisions are affected by the various social, cognitive, and power structures in which individuals are embedded (March and Olsen, 1976). From this standpoint, it is important to stress the mechanisms that serve to influence/convince other stakeholders on the issue that is faced about when, where, and how much to invest in order to seize an opportunity.

Research shows that an opportunity is not labeled as innovative for its intrinsic qualities or because it is superior to competing opportunities (Akrich et al., 2006; Callon and Latour, 1990; Callon, 1999). To seize a specific opportunity requires the presence of spokespeople who succeed in recruiting or converting actors and sponsors. The validation and collective dissemination of an opportunity can be interpreted as a process of diffusion and progressive contagion of the people in and around communities. In that regard, Putnam (2001) has shown that social capital supports trust and enhances an opportunity's legitimacy, which facilitates access to resources. Moreover, research on new organization forms (e.g., DiMaggio and Powell, 1983, 1991; Fligstein, 1996) emphasizes the use of multiple logics by actors, and political competition among communities. Studies argue that socio-political and cognitive legitimacy are

both required for an opportunity to attract resources and become viable; opportunities are seized only when they become legitimized and ultimately, taken-for-granted as social facts (Aldrich and Fiol, 1994; Navis and Glynn, 2010).

Examples from various industries – brew (Bradford, 2000; Carroll and Swaminathan, 1998; Wade, Swaminathan, and Saxon, 1998), software (Lakhani and von Hippel, 2003; O'Mahony and Bechky, 2008), specialty coffee (Rindova and Fombrun, 2001), computer (Levy, 2001), wine (Lukacs, 2000), baby products (Shah and Tripsas 2007), and non-profit (Rao, 1998) – illustrate the significance of communities in seizing opportunities and turning them into successful business endeavors. For instance, the role played by guilds, festivals, magazines, and newsletters found in the community of self-styled brew experts show how collective action and the endorsement from powerful actors may make or break an opportunity. The necessity of a bottom-up approach and the use of local champions that span various communities are also illustrated in the case of organizational innovations that management may be reluctant to support (e.g., Bobrow and Whalen, 2002).

Once the organization is committed to an opportunity, it needs to take advantage of knowledge inside (Ancona and Caldwell, 1992a; Keller, 1986; Taylor and Greve, 2006) and outside (Ancona and Caldwell, 1992b; Katz and Tushman, 1981; von Hippel, 1988) its boundaries to bring a new product, service or process and (re)design a business model in ways that create, deliver, and capture value for customers/users (Osterwalder and Pigneur, 2010). Several examples may serve as an illustration. Hargadon and Sutton (1997) show, for instance, how designers manage to move across communities (mechanical, industrial, electrical, software engineering as well as human factors and ergonomics) and to make original connections between old solutions in a given industry and new problems in another industry. In other words, as a

group of people from eclectic backgrounds, they seize opportunities by spanning various industries and moving knowledge from one place to another – from energy to medical products to financial services to the public sector, etc.

Last year, after sensing an opportunity for adapting electronic devices to the needs of people with mobility issues, Samsung brought a large variety of experts together (e.g., human-computer interaction, electrical engineering, etc.) and developed a demo tablet that is controlled by a human brain (Young Rojahn, 2013). Other examples include Adidas' 50 biomechanical engineers, industrial designers, and electromechanical experts working together to make asymmetrical spikes for Olympic gold medalist, Jeremy Wariner (Hochman, 2008). Boundaries between various communities were also spanned when we saw technology disrupting the healthcare and medical field: 3-D printing was first used to print teeth-straightening braces, and when artificial intelligence and mobile technology delivered an application that can serve as a diagnostic tool (Kotler, 2013). In order to achieve such feats, both boundary spanners and boundary objects are essential.

Dougherty's work on new product development (1992) emphasized the challenges posed by different thought-worlds in terms of the variances in meaning or language across communities. She showed that people from different thought-worlds do not consider the same issues when envisioning the future and do not appreciate the significance of others' issues. For instance, engineers usually personify the values of technical excellence (Kornhauser, 1962; Ritti, 1968; Goldberg, 1976) and thus all they see are technical issues when making sense of a certain problem. Such issues may impede teaming (Edmondson, 2012), which is essential when time to market needs to be accelerated. Fortunately, such circumstances can be mediated thanks to boundary spanners and objects, which facilitate the sharing of thought-worlds to mobilize action

(Bechky, 2003; Carlile, 2002; Henderson, 1991, 1999; Star and Griesemer, 1989). In a detailed study of the role of PowerPoint in the development of a strategy and the actors' required engagement, Kaplan stated that the tool "mediated two discursive practices: collaborative efforts to negotiate meaning and cartographic efforts to adjudicate interests" (2011: 327). Prototypes and modeling are also seen as key when seizing opportunities (e.g., Leonard-Barton, 1995; Wheelwright and Clark, 1995).

1.4.3   Transforming: the negociation faculty of communities

Transforming the organization in order to profit from an innovation entails the development of new routines and/or the change of older ones. While managers usually respond to changes by espousing new or different organizational interpretative representations (Bartunek, 1984), their decisions or interpretations inspire but they do not dictate adaptation; adaptation occurs in practice, through the everyday activities that individuals engage in (Johnson, Langley, Melin, and Whittington, 2007).

Routines cannot be designed a priori, in a top-down manner, and framed independently of practice; knowledge and practice cannot be separated from each other, because knowing emerges from the ongoing and situated actions of practitioners engaging in the world (Brown and Duguid, 1991; 2001; Lave and Wenger, 1991; Wenger, 1998). It is therefore the collective of communities that recreates work arrangements according to new goals or new means. They adjust their representations about the way of doing things together – a new set of scripts such as the patterns of action and interaction (e.g., who interacts with whom, in what ways, at what times) are shaped in practice (Barley, 1986; Barrett and Walsham, 1999; Edmondson, Bohmer and Pisano, 2001). This requires a strong dose of learning-by-doing and trial-and-error (Rerup

and Feldman, 2011) as the new representations can only come from the actual doing of things within the new context (Cohen et al., 1996).

The decisions managers make following changes need to be made sense of by the collective of communities that shape the organization in order to be deployed and enacted into routines (Feldman, 2000; Hodgson 2009); the generation and modification of routines is a collective process (Becker, 2004; Dionysiou and Tsoukas, 2013; Zolla and Winter, 2002). Research shows that "actions are necessary to transform rudimentary ideas about what needs to be done and how it should be done into routines" (Rerup and Feldman, 2011: 601). The latter are constituted through a networked pattern in which the performative (specific actions) and ostensive (abstract patterns) parts of routines participate in the production or transformation of the other (Dionysiou and Tsoukas, 2013; Feldman and Pentland, 2003; Pentland and Feldman, 2005; Zbaracki and Bergen, 2010): "the meaning of the ostensive patterns that emerge depends on the point of view of those experiencing the actions" (Rerup and Feldman, 2011: 580). This process is not neutral; studies stress that communities have competing interests that play an important role here (Guston, 1999; Nicolini, 2010). After all, communities control a specific expertise, which may gain or lose importance in a transformation (e.g., Pettigrew, 1973).

As more and more organizations are pluralistic environments characterized by a variety of logics of governance among different communities, divergent interests must co-exist (Denis, Langley, and Rouleau, 2007; Hardy, 1991; Jarzabkowski and Fenton, 2006). Change may only emerge through the boundary work communities engage in around the innovation. Barley (1986) illustrates such dynamics in his famous ethnographic study of CT scanners' introduction in radiology departments: roles and responsibilities of the various communities involved evolved

over time into an emerging, negotiated division of labor (see Black, Carlile, and Repenning, 2004, for another in-depth analysis of these dynamics).

Inability to accommodate the variety of communities' interests in the development of new routines may impede the transformation (e.g., Newell et al., 2006; Robertson, 2007; Mørk et al., 2010). Because knowledge is invested (Carlile, 2002), communities tend to react negatively when the transformation means that they will not be able to do things according to what they already know. For instance, Novek (2002) depicts the unfortunate consequences associated with the reaction of communities of nurses and pharmacists to the introduction of digital technologies: because nurses' expectations were not met – they felt that they were losing control over their practice – the transformation failed.

Boundary spanning activities support the learning necessary for technology integration through the negotiation that needs to take place between communities' competing interests. Regular exchanges that span boundaries enhance learning and facilitate forging new patterns of interaction (Edmondson, Bohmer, and Pisano, 2001). In that regard, individuals bridging various communities may help educate the latter on each other's interests and difficulties and unravel misunderstandings of their respective constraints (Barley, 1996; Bechky, 2003; Levina and Vaast, 2005). Boundary objects may also help in representing communities' knowledge, learning about their differences and dependencies before jointly transforming to resolve negative consequences (Carlile, 2002).

Communities that manage to exchange on their perceptions on the transformation in a manner that echoes the complexity of their respective real-world environment may lead to easier adjustments that make communities meet each other halfway instead of becoming withdrawn.

Transformation is then molded within a context that follows the communities' activities and relates to their experience and interests rather than, for instance, being mere instructions from one to another. When spanning boundaries allow for common ground to be created between communities and for cognitive frames to be continually shared and negotiated in order to accommodate the frames of others, communities become a springboard for an organization to better embrace innovation and change (Kellogg, Orlikowski, and Yates, 2006; Weick, 1995).

1.5   DISCUSSION AND CONCLUSION

My essay outlines and elaborates on the DCF processes of sensing, seizing, and transforming from the standpoint of communities. These activities, I believe, should be better acknowledged as part of the microfoundations of DC, which so far has mainly emphasized the entrepreneurial drive of managers (e.g., Adner and Helfat, 2003; Augier and Teece, 2008; Bergen and Peteraf, 2002; Sirmon and Hitt, 2009; Teece, 2007, 2009). I do not reject the significance of entrepreneurship as part of the microfoundations of DC; I reject the sole, automatic association of the DC microfoundations with top management abilities.

In addition to Teece's claim that "[organizations] with strong dynamic capabilities are intensely entrepreneurial" (2007: 1319), I argue that organizations with strong dynamic capabilities are also intensely communal. As demonstrated in the previous section and depicted in figure 1, communities, because of their creative power, legitimating influence and problem solving abilities, as well as their negotiation faculty, are a central part of the processes of sensing, seizing, and transforming. Communication within and between communities is crucial, including the community of entrepreneurial managers, and is generated and sustained through boundary spanning.

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SENSING

Entrepreneurial managers scan and interpret the environment in search for promising opportunities.

Boundary spanners navigate through community-based, knowledge-creating activities and help combine knowledge from different communities, which fosters creative impulses.

SEIZING

Entrepreneurial managers make investment and commercialization decisions that mobilize resources to address certain opportunities.

Boundary spanners build opportunities' legitimacy throughout communities and translate knowledge stemming from various communities to solve problems.

TRANSFORMING

Entrepreneurial managers set governance principles that align tangible and intangible assets in order to generate rents and maximize business performance.

Boundary spanners help communities negotiate between divergent interests and (re)create routines that support adaptation in practice.

Figure 1 - Explicating dynamic capabilities through entrepreneurial management and boundary spanning

Moreover, a growing number of entrepreneurship scholars stress the nonexistence of the lone entrepreneur and suggest that studying entrepreneurship through what an individual does is inappropriate and does not represent the reality of the entrepreneurial phenomenon (e.g., Aldrich and Cliff, 2003; Gartner, 1988, 2001). In this respect, Hargadon's description of the invention of the lightbulb serves as a good illustration:

> Edison neither invented the lightbulb nor acted alone in improving upon it. The web around Edison was thick with ties to other people, ideas, and objects that together made up his particular "invention". Who Edison knew, what he and his engineers learned from the existing technologies of the day, what they believed possible, and who they convinced to join in their ventures all created the landscape in which his innovations took shape. Ignoring these connections hides central insights into how innovation unfolds, because this web shapes the behavior of individuals and organizations in profound ways. (2003: 7)

This representation of Edison's activities shows that the entrepreneur can't achieve innovation without the involvement of others; entrepreneurial ventures develop over time and within the context of communities. This leads me to posit that focusing on entrepreneurial management only insulates top management from the views of, for instance, front-line employees who, according to Hamel (2007), are in the best position to see the future coming. Unfortunately, the microfoundations of DC so far have been posited at the unique core of entrepreneurial management to an extreme that may myopically cripple the research stream by opening the door for attractive, yet misleadingly, findings that stage a few managers as innovation superheroes due to unobserved heterogeneity. There just appears to be a tendency when management becomes strategic to see no one else but top managers as making up the organization. Nevertheless, tackling the microfoundations of DC should certainly not diminish our ability to apprehend complexity.

Still, there is a window for more thorough analysis of the microfoundations of DC. For instance, Teece acknowledges that organizations are "vulnerable if the sensing, creative, and

learning functions are left to the cognitive traits of a few individuals" (2007: 1323) and that they need "a collaborative nonhierarchical management style assisted by establishing councils and other integration forums" (1336). I believe the DCF is based on making innovation everyone's job by having various communities engaging in company-wide conversations (Hamel, 2007). In this respect, cultivating a sense of belonging among individuals within a collective environment should take precedence over manipulating resources in order to generate rents (e.g., Zott, 2003). Asset orchestration is definitely not how management garners loyalty and commitment and achieves adherence to innovation and change as important objectives – affect, loyalty, shared values, and personal involvement are key elements that should not be disregarded and they are nurtured within the communities individuals belong to (Brint, 2001).

The use of the concept of community throughout my analysis of the DCF processes draws attention to the boundary spanning activities that support the knowledge work of communities. Boundary spanners have been largely overlooked in the study of the microfoundations of DC. Yet, I have shown that this role is essential in supporting the building and deployment of DC that perform at high levels. Such a role differs from entrepreneurial management. First, boundary spanners has been shown to emerge slowly in community-based activities (Fleming and Waguespack, 2007; Levina and Vaast, 2005), as opposed to individuals who are promoted to management positions. Indeed, organizations that have actually nominated individuals to the role of boundary spanner have seen them achieve mitigated results (Nochur and Allen, 1992). Second, boundary spanners may cue to changing market and technological reality and identify promising routes, but they are not attached to the evaluation of an opportunity's economic potential under the principles of a final go-no go decision procedure. Rather, they take part in a process of repeated and multiple feedback loops throughout

communities, which may span various organizations (e.g., Dyer and Singh, 1998; Powell, 1996). Indeed, creative ideas take time to construct (Campbell, 1960; Csikszentmihalyi, 1997; Mainemelis, 2002, 2010; Russ, 1993; Wallas, 1926). Opportunities are thus progressively, but also iteratively and collectively, revealed, enhanced, nurtured, interpreted, enacted and codified.

Finally, considering communities in the study of the microfoundations of DC opens avenues for future research. First, future research should investigate the interplay between top management and communities and how the latter impacts the development and deployment of DC that perform at high levels. Do organizations with strong community-based activities fare better than organizations with top managers presenting razor-sharp cognitive abilities? How does boundary spanning influence entrepreneurial management? Studying boundary spanning activities using longitudinal research design could also be a promising avenue for future research. While studies have looked at boundary spanning at certain point throughout the microfoundations of DC (e.g., Carlile, 2002; Ancona, and Caldwell, 1992b; Bechky, 2003), research has yet to cover the three processes of sensing, seizing, and transforming. Do various boundary spanners intervene throughout this series of processes and if so, how does this take form? How is knowledge relayed between communities taking over from the process of sensing to seizing or from seizing to transforming?

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CHAPTER TWO – SECOND PAPER

KNOWING COMMUNITIES IN THE FRONT END OF INNOVATION

Abstract: Drawing on a case study at Ubisoft, a major creative firm in the video-game industry, this article depicts how knowing communities serve as the engine that fuels the front end of innovation. Activities in which knowing communities engage are described and contextualize the five key components of Koen et al. (2001)'s seminal work on that matter. Four types of activities are identified: scripted internal activities are prescribed by management in terms of knowledge development occurring inside knowing communities; scripted external activities are also prescribed by management, and are characterized by efforts that community members make to strengthen ties between the firm's knowing communities and knowledge agents outside the firm; unscripted internal activities are not prescribed by management and occur between members of different knowing communities who spontaneously work on a given project together; unscripted external activities are free of managerial prescription as well, and are characterized by members of knowing communities taking part off-hour in activities outside the firm's boundaries that can stimulate creativity. Each type of activities provides some deep insights that help managers better understand how to nurture knowing communities in order to reap their benefits for creativity and innovation.

2.1   INTRODUCTION

According to Barsh et al. (2007), 70% of executives from various sectors regard innovation as one of the three main growth drivers for their firm; however, 65% of them are not confident about their decisions to stimulate innovation. This large discrepancy between the approaches and the methods' perceived relevance regarding supporting and accelerating innovation is a major challenge for firms' economic development and competitiveness.

Here, we investigate the front end of innovation (FEI) within a major creative firm in the videogame industry, Ubisoft and its development studio in Montreal, Canada. We draw on the seminal work of Koen et al. (2001), with a specific emphasis on the knowing communities as the engine that fuels the FEI. Knowing communities are groups of people who are tied together by their practice or by their common interest or passion. They interact regularly with each other and exchange about their domain of knowledge in a not-so-organized fashion. At Ubisoft, they represent script writers and game-designers, graphic artists in 2D and 3D, sound designers, software programmers, and testers. Knowing communities are also active outside of the firm, which can represent music enthusiasts, techno geeks, movie fans, salsa dancers, etc.

Research has shown that creativity and innovation depend heavily on the knowing communities associated with the firm, rather than only on the firm's formal R&D activities or individual employees' initiatives (e.g., Drazin et al. 1999; Hargadon and Bechky 2006). Creative firms bring together and combine a variety of knowledge as means to produce goods and/or services. They hence try to make the most of knowing communities' activities that build competences in association with the development of knowledge and/or the implementation of one function, one service, or one means. In this sense, particularly when analyzing the FEI, we

need to consider a firm as an assemblage of members from various knowing communities formally and informally building on each other's expertise, field knowledge and ideas (Brown and Duguid 2000). We posit that knowing communities serve as the engine that fuels the FEI and explore the activities in which they engage and through which they are nurtured. To this end, we undertook a qualitative research study, now in its fifteenth year, of how a creative powerhouse deals with the identification and analysis of opportunities, the generation and selection of ideas and the development of concepts that can be turn into projects.

2.2   THE FRONT END: A REVIEW

First popularized in the early 1990s, the term "fuzzy front end" is associated with the idea generation and knowledge creation activities that precede the decision to launch or not to launch a formal development project (Griffith-Hemans and Grover 2006; Reid and de Brentani 2004). While it is recognized as the foundation of successful innovation (Cooper and Kleinschmidt 1987), only a small number of empirical studies have been conducted on the actual unfolding of the front end activities in successful creative firms. It relates to activities that other scholars have previously explored (e.g., Crawford 1980; March 1991), but typically only in nonspecific terms, which leads to the current need for these activities to be further documented and analyzed. While the front end has been recognized as chaotic, unpredictable and less structured in comparison to the new product and process development and commercialization phases (Backman et al. 2007; Crawford and Di Benedetto 2008), scholars agree that it offers the greatest potential for improving firms' innovative abilities (Smith and Reinertsen 1991; Verworn et al. 2008; Zhang et Doll 2001).

Though there has been an effort to offer approaches to handling the FEI in the literature –

namely in terms of strategy (Khurana and Rosenthal 1997), structure (Markham and Lee 2013;

Reinertsen 1999), metrics (Smith et al. 1999; Buggie 2002), information technology (Gordon et

al. 2008), and communication (Moenart et al. 1995) – its understanding remains a challenge for

management researchers and practitioners alike. To better conceptualize the FEI, Koen et al.

(2001) offer one of few well substantiated theoretical models. The authors deconstruct the front

end into five key components moving from the identification of an opportunity and its analysis to

its development and maturation into concrete ideas from which one is eventually selected to be

transformed into a formal concept that is defined in business terms. This model is convincing

because it stems from multiple environments and provides clarity and a common language to the

FEI and thus achieves to reduce the fuzziness associated with it. However, there is a need to

better contextualize the model to examine the collective nature of the front end elements and

their management. To that end, it appears important to move away from the individual and

organizational levels of analysis and to reflect upon what is considered as the principal source of

knowledge in firms: knowing communities (Amin and Cohendet 2004). As Drazin et al.

expressed (1999: 291), "creative processes at the organizational level may not simply aggregate

from individual or group efforts; rather, they may emerge from a process of negotiating multiple

and potentially competing interests between different communities or groups within the

organization (e.g., those technically responsible for creative activity and those managing the

creative process)".

More and more studies demonstrate the benefits produced by several types of

communities within and around firms: communities of practitioners (Constant 1984; 1987),

epistemic communities (Cohendet and Meyer-Krahmer 2001; Cowan et al. 2000); communities

of practice (Brown and Duguid 1991, 2001; Lave and Wenger 1991; Wenger 1998), communities of specialists (Cohendet and Simon 2007); communities of creation (Sawnhey and Prandelli 2000), communities of innovation (Lynn et al. 1996; Lynn et al. 1997), communities of knowing (Boland and Tenkasi 1995), knowledge-based communities (David and Foray 2003), learning communities (Bogenrieder and Nooteboom 2003), occupational communities (Beckhy 2003), user communities (von Hippel 1986, 2001), and so on. Since we do not want to focus on those distinctions in this paper (for an extensive review, see Amin and Roberts, 2008), we use "knowing communities" as an umbrella term. In the end, knowledge is at the core of both the activities and the outcomes of all of these communities and they can broadly be defined as entities that rely on repeated and continuous interactions between individuals sharing a common cognitive interest or objective, and actively exchanging and accumulating knowledge in a given field. Through this regular exchange, common mental schemas, common social norms, and even a common *lingo* are built and, for instance, guide the newcomers into creative activities.

Management research on knowing communities provides some insights into the FEI. First, we know that firms must not rely solely on their employees' individual knowledge in order to identify and analyze opportunities. They must bank on their employees' belonging to internal/external communities, where it is possible to absorb new knowledge and to deepen existing knowledge (Cohendet and Simon 2007; Kreiner and Schultz 1993; Saxenian 1994). Second, the organization of various perspectives provides the real potential for the idea generation and selection since new ideas change from a very specialized knowledge localized in one community into procedural knowledge encompassing numerous knowing communities' perspectives (Boland and Tenkasi 1995; Midler 2004). One assists to the deepening, the enriching, and the technical validation of the idea before its rhetorical broadening. Third, in order

to develop the idea into a concept, various agents of the knowing communities push it up the firm ladder by finding allies who may have a stake in it (Augsdorfer 2005; Napier and Nilsson 2006). Crawford (1980) would say that the idea is held up the innovation charter in order to get project-level commitment. In practical terms, there needs some sort of integration into the strategy and with ongoing projects of the firm as well as an association to actual screening criteria (Cooper 1990; de Brentani and Dröge 1988).

More work is however needed to better understand how knowing communities fuel the FEI and how their activities are actualized in practice. To this end, we conducted a qualitative research study in a successful creative firm.

2.3   METHOD

Using a single-case study design, we were able to investigate the activities of knowing communities throughout the FEI at Ubisoft. This global videogame company counts 25 studios in 17 countries and subsidiaries in 26 countries. It employs the second largest amount of in-house developers in the world. In our study, we focused more specifically on the case of Ubisoft Montréal studio, which quickly became the creative powerhouse of the firm and is now known for its blockbuster games and high-selling franchises with the launch of games like Prince of Persia™ (over 17 million copies sold), Rainbow Six™ (over 21 million copies), Splinter Cell™ (over 19 million copies), and Assassin's Creed™ (over 28 million copies). The number of employees went from 300 in 1997 to about 2,300 in 2013, which demonstrates the remarkable growth experienced by the Montréal studio in the last decade.

Multiple sources and techniques were used to gather qualitative data on the front end activities at Ubisoft Montréal studio. The main source was a 14-month ethnographic study in

1999 (Simon, 2002) followed by a 6-month ethnographic study in 2008 (Tremblay, 2008). In both cases, we were able to spend two to three days a week in the firm, observing, questioning and conducting in-depth interviews with various stakeholders who take part in FEI and NPPD activities. Hundreds of pages of field notes gave a voluntarily "candid", fine-grainded account of day-to-day work and activities, creative discussions and interactions that took place. Regular follow-up interviews and secondary data analysis were implemented since 1999 to keep the relevant data up to date (general trends at Ubisoft, new projects in development, implementation of IT systems and work processes, working atmosphere, etc.) and to allow interim data analysis and corroboration to ensure the match between findings and participant reality. Three parallel studies were also conducted on creativity and innovation management (Bloch, 2012; Harvey, 2012; Simon et al., 2010), involving master and doctoral students and allowed for triangulation through more in-depth interviews. This research is inspired by a multi-method approach and builds on selected data from those studies, revisiting the data through Koen et al. (2001)'s conceptual framework. Our data account allowed us to analyze closely how ideas were generated, transformed, and enriched before and during the development of new games and from the perspective of a multitude of actors, which was especially powerful for our intended exploration of the knowing communities' activities throughout the FEI.

2.4   MAIN FINDINGS

Four major categories ultimately emerged from our analysis of the data:

- Scripted internal activities
- Scripted external activities
- Unscripted internal activities
- Unscripted external activities

Activities internal to the firm are driven by the knowing communities' particular occupations, be it game design (e.g., narrative designers), graphic design (e.g., environment artists, level designers, character modeler), audio design (e.g., sound engineers), programing (e.g., computer programmers, software engineers, tool designers), and so on. Externally, activities are driven by the passions and hobbies of knowing communities' members. Activities may also be scripted, which means that their content is directed by the firm, or unscripted, which means that the activities' content is not directed by the firm but rather natural, even spur of the moment. This is illustrated in figure 2.

	Internal	External
Scripted	Monthly meetings, plenary sessions and specialized presentations organized by appointed leaders. Conception workshops that bring together members of various knowing communities to work on an opportunity/idea. Kick-off meetings serving as an official go/no-go moment.	Participation in local and international events where subject matters are identified as pertinent for current and future endeavors. Internal exhibits and open competitions to display creative productions on themes that could be valuable to the business.
Unscripted	Work floor as an open space where different knowing communities are physically mixed. Spontaneous challenges between knowing communities' members working on a same project. Collaboration tools available for specialized discussions within knowing communities. Soft hierarchical structure that allows easy access to management.	Invitation to take part in shows, concerts, exhibitions, parties or any other events that can stimulate curiosity and awaken creativity. Support for local festivals and open workshops even if management has no bearing over their content.

Figure 2 - Uncovering knowing activities at the heart of the FEI model by Koen et al. (2001)

2.4.1   Scripted internal activities

To ensure sustained interactions within each knowing community, management has appointed leaders whose responsibility is to maintain the momentum of the group. Monthly meetings, plenary sessions and specialized presentations are scheduled to bring out new opportunities. According to a manager, "artists must be able to exchange images and organize discussion to explore new avenues or to revive others, while programmers must be able to share source lines of code and specialized scripts that we deemed important". Management appears to have an agenda in terms of knowledge development for its knowing communities. Those exploration activities do not happen freely and are somewhat preconditioned; there are certain bits of knowledge that are "deemed important" and on which management wants interaction to happen.

Once an opportunity has been sensed and communicated, the interested knowing communities spontaneously activate themselves around it. When scripted, these activities represent meetings that bring together members of various knowing communities: conception workshops. While they can be organized by anyone, these meetings allow for the production of two specific documents: the vision behind the idea, which describes the numerous content items, and the team's mandate, which offers a rather basic planning in terms of budget, deadlines, technology, etc. Most of the exchanges that take place in conception workshops are still abstract at first. The various actors involved exchange on stories and unleash their most ambitious imaginings using whiteboards to draw ideas before being more concrete. Then, with everyone's input, they try to build a more solid argumentation around the vision before it is carried out by a smaller group to the hierarchy.

When the idea for a new game is ready, a kick-off meeting is organized with the idea core group and the studio CEO, the creative chief officer, the production director, and experts in content, operations, and marketing from the headquarter office in Paris. It serves as an official go/no-go moment where the core group behind the idea makes its pitch and tries to sell the concept which came out of the previous activities. A PowerPoint presentation is made to the committee and a fake game footage is often presented along with the vision of the game and the team's mandate. The fake game footage offers a sort of video trailer which graphically materializes a majority of the intentions of the group in order to reflect the gaming experience for future players. At one point, the core group leaves the meeting room for the committee's deliberation, which is based on precise criteria, namely the degree to which the concept meet Ubisoft's strategic vision in terms of global development, console targeting, market development, the expected needs in terms of human, financial and material resources, and the fit with the Ubisoft brand.

When the core group returns to the meeting room, it receives a notice: "Concept approval", "Improve" or "New mandate". In the first case, the group can enter pre-production with their concept. In the second case, it must improve its concept and receives close monitoring by some of the committee experts to do so. Finally, in the last case, the core group members are asked to refocus their work activities on something else and the group is often dismantled as members join other projects that are ongoing in the firm.

2.4.2 Scripted external activities

Management put time and efforts to strengthen the ties within Ubisoft's knowing communities, but also with agents outside of the firm. There is an openness to external networks that constantly feeds creativity internally, allowing knowing communities to develop their capacity to absorb new trends, and to renew their knowledge. In this vein, the local environment serves as the primary source of inspiration for Ubisoft's knowing communities. For instance, Ubisoft actively participates in the Montreal International Games Summit, the Arcadia festival, or monthly sessions of the International Games Developers Association which all are public events dedicated to video game culture in Canada. The firm identifies subject matters that are of interest for their current and future endeavors and organizes activities that allow knowledge to be created around them. According to a manager, "a great variety of events [i.e., talks on the roof of the building] may allow us to ignite a fire in the mind of our crew".

Management also offers the occasion for artists to exhibit their creative productions in virtual galleries and organizes open competitions on themes that could be valuable to their business. This is in line with the view of knowing communities' members, notably a character modeler who sees reputation as the best incentive to sense opportunities, and says: "We are really motivated by our ego. When you have found something really, really hot, it's gratifying to express it; you want to do a show... What you're worth is what you do." Through this quote, we see that the motivation to come up with new intriguing opportunities is in essence self-imposed. A sort of reputation market on which everyone is playing appears to have developed within the firm. Ubisoft organized activities to take advantage of its knowing communities' modus operandi that is one of "show and tell" rather than "hide and seek". The role of management has then

become one of fueling this internal reputation market, namely by making sure that almost everyone has tried (or at least knows) others' work.

2.4.3   Unscripted internal activities

Other exchanges between knowing communities are unscripted activities. Knowing communities' members are distributed internally in various projects, which encourage cohesion and facilitate ideation. The work floor is an open space where different knowing communities are physically mixed, a programmer sits beside an artist who sits with a designer, and together they work on a given project. All of this is done voluntarily and such a free setup accelerates the exchange of knowledge as they relish all sorts of challenges coming from each other. For instance, a game designer may seek to experiment with an idea by putting a programmer to the test of accomplishing something new. In response, the programmer would enhance the proposal that is made by adding some of his domain knowledge. Challenges actually help various knowing communities understanding the benefits of extending their collective strengths around an opportunity and turn it into an idea.

The workspace is organized in an unscripted manner and encourages unstaged interactions. People are running in all directions, workspaces are constantly rearranged and it is not always clear who is doing what or how, but the ideas are progressing into concepts and some succeed in becoming projects. It is as if there is an informal agreement between knowing communities and management: work will get done but they need space and freedom to strive by exploring, creating, discovering, being active and learning. To this end, management has made collaboration tools available, including a SharePoint server, discussion forums and thematic

Wikis. However, it does not bear upon the content of these activities. One manager said: "The Wiki is the best way to put a community to work on something they care about and to do it on their own. It allows them to take control of things; they can build something together." The exchanges that take place on such platforms are for the most part very specific and go into many details (i.e., a tool designer posting very elaborated descriptions about the architecture of a system), and sometimes question the current state of things.

For all other ideas that are not about new games, Ubisoft's knowing communities take advantage of a shopfloor culture of sharing and of an organizational structure that is very soft to present their ideas to management. Several of our informants mentioned that managers are accessible and that their office is always open. We actually observed executive producers and creative directors taking a spot on the work floor among all employees when working on a project. Everyone can have coffee and chat with them. Similar to concepts of new games, concepts that are part of a game production must be submitted to the management of the project. The creative director and the executive producer are those who set the creation constraints to their team, but also those who work with leaders of the various knowing communities and try to understand what they do and what they would like to do. In so doing, they build, communicate and maintain a coherent global vision of the game that is being produced. In order to be approved, the ideas that are presented to them must be in line with the latter.

2.4.4 Unscripted external activities

External activities can also be unscripted in the sense that Ubisoft's members are highly encouraged by management to take part in a professional capacity, but also off-hour, to various

events that take place in Montreal. For instance, the firm offers tickets for shows, concerts, exhibitions, parties or any other events that can stimulate curiosity and awaken creativity, even if management has no bearing over the content of these activities. As one manager explained, they are interested in building as many connections as possible: "Our links with the milieu allow us to build tentacles. We have more than 8,000 eyes and ears in the studio; we must take advantage of that."

The objective of these initiatives is twofold: to encourage the knowing communities at Ubisoft to discover new sources of creativity but also to contribute to the local cultural life by offering activities to the public. While it draws ideas from the environment, Ubisoft also helps to influence it, generating a reservoir of creative talent. For instance, since 2003, it is the main sponsor of the Fantasia festival dedicated to fantasy/fantastic genre cinema. The firm also organized in 2007 a street festival to celebrate its tenth anniversary in Montreal and was keen on supporting the multiple talents of the area, whether amateur or professional. The festival mobilized numerous types of artists (e.g., salsa dancers, musicians or post-folk painters) and welcomed nearly 10,000 visitors. This success led Ubisoft to repeat the experience the following year and to organize similar events. In addition, it supports an open workshops initiative, to which attend over a hundred artists of the area. These activities have contributed to the establishment and reinforcement of an industrial cluster in Montreal dedicated to mutlimedia innovations, offering an essential hub for video game designers on the international scene. It includes animation pioneers (e.g., Softimage or Discreet), leading video game developers (e.g., Electronic Arts, Eidos, or A2M), high-tech business services (e.g., BugTracker or Toon Boom), professional associations (e.g., Alliance numériQC or International Game Developers

Association) as well as research centers (e.g., Society for Arts and Technology). This is what brings Ubisoft Montréal studio's executives to claim: "Our reseach lab, our playground, is the city of Montreal".

2.4.5 An illustration

The following vignettes depict how the front end elements are manifested at Ubisoft.

Vignette #1: While a technology centered on the use of a 3D motion tracking camera was being developed, a game designer passionate about fitness was working alongside programmers who shared his passion. The latter could exchange on the potential of the new technology, which provided the germ for the integration of original movements and series to a new game. Four months later, documents about the idea were produced through conception workshops. According to a creative director on the project, this timespan facilitated the "thickening" of the idea and allowed for the smooth integration of each knowing community's perspective: "We had the nose in our respective projects for quite some time but somehow kept thinking and discussing the opportunity. After four months, we were all back with a cool head and could produce the required documents for the next step." This served as the starting point for Your Shape™, a game that guides the player through various aerobic exercises that can be tailored to target certain parts of the body.

Vignette #2: During the production of the third episode of Splinter Cell™, some of the guys who were passionate about electronic music discovered Amon Tobin, a Brazilian artist who had just moved to Montreal, in an event that took place not far from work. A few days after having played some of his songs in the workplace and having exchanged

with other colleagues about its fit with Splinter Cell™'s atmosphere, a couple of them convinced the creative director to come to an intimate concert where it would be possible to meet with the artist. Following the meeting, the director was quick to sign Tobin to a contract to perform the soundtrack of the game.

Both of these vignettes show how knowing communities sensed an opportunity and developed an idea around it before building it into a concept that could be fit into a project or serve as the basis for a new project. We can appreciate the capacity of knowing communities to build on knowledge found outside of the firm and combine it with their practice inside the firm to sustain creative efforts. Members of one knowing community quickly turn to other of their peers and engage together in a series of iterations in order to move from an opportunity to an idea and a concept, as illustrated in Koen et al.'s model. Ubisoft's knowing communities sensed an opportunity by integrating knowledge from the environment and seized it as an idea by exchanging with other members inside the firm, all of which took place in a rather unscripted manner. As progress is made, a more scripted path is drawn to thicken the idea in question and shape it as a concept that can be "sold" to management, and introduced in a formalized new product development project.

2.5   MANAGERIAL IMPLICATIONS

Our study illustrates how knowing communities serve as the engine that fuels the FEI. Employees can build a link between internal and external knowledge through their engagement in knowing communities – which is supported by scripted (e.g., the interaction that stems from the work of appointed practice leaders) and unscripted activities (e.g., the free flow of interaction

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on collaboration tools) – and play the role of intermediaries between different worlds which allows them to come up with new ideas. While this link appears to be created spontaneously, we see that management also provokes and supports it, not only through the organization of various activities close to the firm's business interests, but also through the encouragement or tolerance of non-scripted activities that may first appear to be far from the firm's actual business. These activities may occur inside or outside the firm but usually take place in a rather free space that is not subject to managerial prescription. When an opportunity has been identified and analyzed, scripted activities take over and play a crucial role in developing it until it can be turned into an official project. Throughout this process, management takes advantage of the permanent dialogue that it has nurtured within and between knowing communities and encourages the thickening of ideas through the organization of activities that offer defined parameters and are centered around the achievement of definite objectives and on the production of certain documents. Thus, at one point, the exchanges are funneled towards an end which facilitates the assemblage of various perspectives.

Yet, what should practitioners do to reap the claimed benefits? What are the challenges in nurturing and sustaining knowing communities? The FEI's management principles differ greatly from the more traditional ones that support the NPPD and commercialization phases. We thus need to reconsider the roles of the managers dedicated to creativity and innovation. On the one hand, they should be more focused on the instauration of connective, open-to-the-outside and exploratory contexts. This means supporting employee engagement within knowing communities through participation in external undertakings, prompting improbable encounters by inviting outsiders to interact with the firm's knowing communities, organizing events that bring together

stakeholders from various backgrounds, and offering spaces inside the firm so that a productive dialogue takes place within and between knowing communities. On the other hand, they should pay more attention to emerging novelty and weak signals from the knowing communities, providing them with a wisely balanced mix of weak prescriptions – to partially shape and orient collective interests and curiosities aligned with the firm's strategic issues – and timely support for the unfolding, growth, validation, and enactment of new ideas. A soft organizational structure that facilitates exchanges between knowing communities and management, an environment that does not discourage people to speak out, and the genuine desire of managers to listen to ideas and their will to experiment with novelty may all serve as examples of relevant management practice for the FEI.

Management plays an important role in maintaining a certain rhythm for the integration of distributed bits of knowledge by defining a global vision, softly structuring some of the knowing communities' activities, and allowing the resources necessary for the detection, communication and development of ideas. Over the years, through the activities depicted in our findings, Ubisoft Montréal studio has been able to combine various creative talents, and to maintain a vibrant ecosystem for its respective knowing communities to thrive. This firm offers a structure rooted in formal and informal relationships between employees, but also with the milieu, which is itself a significant source of knowledge. There is an order that is implicitly and dynamically negotiated between Ubisoft's knowing communities and management. This process should not entirely be seen as a well-defined management strategy since activities that are depicted in our findings are not always consciously piloted. Management is nevertheless aware of the importance of creating a context that is conducive to social interaction and spontaneous

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exchanges inside and outside of the firm and therefore attempts to benefit from having over 2,000 creative enthusiasts collocated in their Montréal studio.

2.6 CONCLUSION

We showed that the FEI is not the preserve of a select group of actors, part of the R&D department or strategic business units, but is driven by the activities of knowing communities. We point to a successful creative firm's ability to cultivate its regime of knowing communities in order to remain open to the maximum of knowledge and depart from a closed and rigid model of innovation. We observed four types of activities that knowing communities engage in: a set of scripted/internal activities and a set of scripted/external activities as well as a set of unscripted/internal activities and a set of unscripted/external activities. To some extent the power over those activities are delegated to the knowing communities and a loose compromise with hierarchy is palpable. The appreciation of the firm as an assemblage of knowing communities is essential to understanding the engine that fuels the various phases of the FEI. Managers need to understand that a knowing community's ability to generate creativity depends on a delicate balance between autonomy and managerial control: community members need to be given sufficient space and freedom to experiment and toy around with creative ideas, while simultaneously being monitored to ensure that the knowledge they develop stays in line with the organization's strategy.

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CHAPTER THREE – THIRD PAPER

ANOTHER COG IN THE MACHINE: DESIGNING COMMUNITIES OF PRACTICE

WITHIN PROFESSIONAL BUREAUCRACIES

Abstract: This paper explores the purposeful design and development of a community of practice within a professional bureaucracy. The view of communities of practice has shifted from fundamentally organic entities to ones that can be deliberately designed and developed and they have frequently been presented as a panacea for knowledge sharing and creation, a basis for innovation in organizations. However, evidence that organizations have succeeded to achieve this challenge is lacking. Through the processual analysis of such an organizational intervention, this longitudinal study shows that these two contexts – the community of practice and the professional bureaucracy – do not mesh well and create tensions for those employees who are also community of practice members. This implies that the community of practice approach may not serve all types of organizations. The findings also lead to the reconsideration of communities of practice in organizations and a critique of the main appraisal of this approach is presented. It is suggested that communities of practice should be regarded as a social phenomenon rather than an organizational learning tool.

4.1   INTRODUCTION

Today's successful organizations must be regarded as institutions where knowledge and skills are continually developed, refined, updated, and protected through complex learning processes that lead to innovation. Yet, according to 400 senior executives of major organizations across the globe, connecting people and know-how across units remains one of the greatest human issues facing organizations (IBM, 2008). Managing knowledge is indeed easier said than done. It does not consist of simply assembling information as if it were books in a library or files on a hard drive (McDermott and O'Dell, 2001; Zhang and Zhao, 2006). Managing knowledge means creating a social and material infrastructure that encourages knowledge sharing, application, and creation (Davenport and Prusak, 2000; Jacob and Pariat, 2000). There are different means to attain this end, one of which is the community of practice (CoP) (Brown and Duguid, 2001a; Lave and Wenger, 1991; Wenger, 1998).

It is suggested that CoPs need to be developed systematically and strategically (Kimble and Bourdon, 2008; McDermott, 2000; Saint-Onge and Wallace, 2003; Wenger et al, 2002; Wenger, 2004). Indeed, according to Wenger et al. (2002), CoPs are unlikely to achieve their full potential without organizational intervention. However, such an intervention is said to be an art and evidence that organizations have succeeded to achieve this challenge is lacking.

In this study, we investigate the purposeful design and development (PDD) of a CoP within a professional bureaucracy. This study is at the crossroads of several avenues of research. First, while scholars have invited research to explore in which organizational contexts the CoPs approach is the most appropriate knowledge management tool (e.g., Roberts, 2006), the CoP

theory and Mintzberg's seminal work on organizational configurations (1980) have never been considered in relation to each other. Second, for the first time in the literature in this domain, a processual analysis of such an organizational intervention is provided. A grounded theory design is adopted, using empirical findings to understand the failure to design and develop a CoP in sustainable development within a large labour union. Third, the findings show that the two contexts – the CoP and the professional bureaucracy – do not mesh well and create tensions for employees who are also CoP members. This implies that the CoPs approach may not serve all types of organization. Organizations' management should therefore consider the CoPs' context before deciding to adopt this model. The findings also lead to the reconsideration of CoPs in organizations and a critique of the main appraisal of the CoPs approach is presented. It is suggested that CoPs should be regarded as a social phenomenon rather than an organizational learning tool.

The paper is structured as follows. The literature review begins with a review of the origins of the CoP concept and its growth, which shows how the view of CoPs has shifted from fundamentally organic entities to ones that can be deliberately designed and developed. The literature review then introduces a number of accounts which focus more specifically on the management of CoPs, and considers how far insights drawn from these can inform and strengthen their PDD within organizations. The next section describes the case itself and outlines the research method that has been adopted. The empirical findings and their discussion are provided in the next two sections. The focus is put on the theory that emerged about the PDD process of the CoP under study. The paper ends with implications for practice and offers some

conclusions about the need for future research to look at the PDD of CoPs within other organizational configurations.

4.2   BACKGROUND

4.2.1   Community of practice: the roots and development of the concept

Since the pioneering work by Lave and Wenger (1991) on the integration of individuals within a community built around a common practice, the literature on CoPs has constantly evolved, providing increasing recognition of their role in knowledge management. Thus, according to Wenger (1998), CoPs are currently not only seen as a context for the learning of newcomers, but also as a context for new insights to be transformed into knowledge, which can lead to innovation. In this sense, Amin and Cohendet categorically state that: "The proper unit of analysis for knowledge formation in terms of knowing found in practice should be neither individuals nor organizations, but socially distributed activity systems, such as communities." (2004: 30)

"Communities of practice are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis." (Wenger et al, 2002: 4) More precisely, three key interconnected features define a CoP: the mutual engagement of the members, the negotiation of a joint enterprise, and the development of a shared repertoire (Wenger, 1998). Here, mutual engagement refers to the amount and pattern of interactions in which individuals engage with one another. More absorbing than having a title or holding a certain position, this engagement is illustrated by the ties that bind individuals and through which they engage in a joint enterprise. Subsequently, by

referring to a common purpose or a unifying goal, a joint enterprise creates mutual responsibility among individuals and bestows coherence on their actions. Third, a shared repertoire can be defined as the outcome of the previous two features. This outcome can be either formal (forms, procedures, tools, etc.) or informal (concepts, stories, jargon, etc.), but traces the history of the community's mutual engagement. In sum, a CoP is a structure within which members show great self-determination in their ability to contribute to the practice and take collective responsibility for managing the needed knowledge. Furthermore, social learning systems like CoPs involve three modes of belonging: members become engaged through doing things together, talking and producing artifacts; they reflect on their situation and envision themselves in the world through imagination; and they align their activities with processes as they evolve to maintain efficiency (Wenger, 1998).

The learning that occurs within a CoP is interactive. Members learn by engaging in their practice within a collaborative structure, which goes beyond an individual mind. Learning is also mediated by the different perspectives of the individuals participating in the learning context. In this sense, CoP members develop and reinforce their knowledge domain by entering a process known as "perspective making" (Boland and Tenkasi, 1995) through the unfolding of their actions and conversations. These socially embedded mechanisms provide access to the CoP members' experiences and reflections. This in turn allows them to enter cognition-inspired and socially embedded learning paradigms grounded in a common practice.

Over the years, CoP theory development has shown a lack of consensus (Roberts, 2006). From one point of view, a number of scholars (e.g., Brown and Duguid, 1991; Cox, 2005;

Duguid, 2008; Gherardi and Nicolini, 2000; Lave and Wenger, 1991; Raz, 2007) argue that CoPs emerge spontaneously, self-organize their activities, and set their own learning agenda. From this perspective, CoPs cannot be artificially created and managed. On the other hand, many scholars have moved away from the view of naturally emerging CoPs and argue that managers can design and manage them (e.g., Kimble and Bourdon, 2008; McDermott, 2000; Saint-Onge and Wallace, 2003; Wenger et al, 2002; Wenger and Snyder, 2002; Wenger, 2004). In sum, the view of CoPs has shifted from a purely natural and spontaneous initiative to one that is cultivable, even creatable, and which the organization hierarchy can purposefully design to align strategic assets in terms of intellectual capital for a sustainable competitive advantage. Those who adopt this latter view believe CoPs should play a key role in organizations.

4.2.2   Communities of practice design and development in organizations

By emphasizing social interactions shaped by the creation of a network of individuals and by being first and foremost centered on learning, the CoP approach is viewed as a central knowledge management tool in organizations (Cohendet et al, 2006; Wenger and Snyder, 2000). One of the main reason for this view is that in this approach, knowledge is not separated from its context (Pan and Leidner, 2003; Saint-Onge and Wallace, 2003). Consequently, CoPs should be perceived as a strategic asset (Mintzberg, 2009; Saint-Onge and Wallace, 2003) for specifically representing "the social fabric of the learning of organizations" (Wenger, 1998: 253). Put differently, they enable the connection between learning and practice, while overcoming the difficulty of allowing both individual and organizational learning (Cohendet et al, 2003). From a practical standpoint, CoPs' effectiveness regarding reutilizing and improving best practices (e.g.,

Davenport and Probst, 2002), supporting innovation by increasing the sharing and combining of knowledge (e.g., Swan et al, 2002; Tsai and Ghoshal, 1998), as well as regarding generating new opportunities to develop human resources competencies (e.g., Büchel and Raub, 2002; Campbell et al., 2009; Corso et al., 2009) has been recognized.

Similar to quality circles (Wood et al., 1983), the interest shown in CoPs has been translated into new roles being defined for the management of knowledge in organizations. Generally informal at first (e.g., Wenger, 1998), many roles have been formalized over the last few years. Studies have shown the need for organizations to have official sponsors and facilitators for their CoPs (Büchel and Raub, 2002; Fontaine, 2001; Lesser and Everest, 2001; Wenger and Snyder, 2000), as well as steering committees with clear governance mechanisms (McDermott and Archibald, 2010; Probst and Borzillo, 2008). However, the PDD of CoPs remains very ambiguous and many authors warn organizations against taking this route (Brown and Duguid, 1991; Coakes and Clarke, 2006; Harvey, 2011; Lampel and Bhalla, 2007; Lawton, 2000; Thompson, 2005; Ward, 2000; Wenger, 1998; Wenger et al, 2002; Wenger and Snyder, 2000; Schenkel and Teigland, 2008). Hence, this significant issue for research and practice calls for more examination.

Very few examples have been documented of organizations that purposefully designed CoPs, and of those examples, none offer data that are rich enough to really assess this process. In other words, purposeful CoP design and development in organizations lacks a processual analysis, which explicitly and directly observes the process in action and thereby is able to

describe and account for how some the CoP or issue develops and changes over time (Pettigrew, 1997).

Certain of the extant studies use questionnaires to collect data on attitudes and behaviors from the members of purposefully designed and developed CoPs (e.g., Ardichvili et al., 2006; Baker-Eveleth et al., 2011; Hemmasi and Csanda, 2009; Jeon et al., 2011; Nesheim et al., 2011; Kirkman et al., 2011). Albeit interesting, these studies fail to show how such CoPs change over time and, overall, they do not capture the dynamic quality of human conduct in the settings of a CoP PDD. Other studies try to establish guidelines or success factors for the launch and cultivation of CoPs without exploring what really happens and how matters evolve in detail (e.g., Corso et al., 2009; Harvey, 2011; Probst and Borzillo, 2007; Probst and Borzillo, 2008; Scarso et al., 2009). Very few details are given of the interactions between the members, the context in which they take place, and the key CoP stakeholders' ideas and perceptions of the CoP. Still other studies try to gain a better understanding of the functioning of more or less similar extant or no longer existing CoPs and to associate this with their respective performances (Borzillo and Kaminska-Labbé, 2011; Iaquinto et al., 2011; Kohlbacher and Mukai, 2007; Loyarte and Rivera, 2007; Meeuwesen and Berends, 2007; Pavlin, 2006; Pastoors, 2007). Unfortunately, these studies do not follow the CoPs closely over time in order to build a robust longitudinal study whose results could account for and explain the what, why and how of the links between the CoP context, design and develop process and outcome.

Actual longitudinal studies on the PDD of CoPs are very hard to find. Among those that adopt this approach, Garavan et al. (2007) offer great insights from the CoP manager's

perspective. Unfortunately, the authors do not consider other stakeholders' perspective (e.g., the members), which limits our understanding of the phenomenon under study. Swan et al.'s longitudinal study (2002) on the PDD of a CoP around a specific disease shows how the use of a "community" discourse played a key role in mobilizing medical professionals to reflect on their practice. The authors suggest that the metaphor of the CoP as a stage from which professionals could collaborate helped shape a shared sense of desire to make a difference to patients. However, the unit of analysis is the innovation process through the PDD of a CoP, one in an inter-organizational context with third-party sponsorship rather than the PDD process of a CoP within a particular organization. The authors' findings, although thought-provoking, can hardly be applied to an organization concerned with the PDD of a CoP comprising its own employees.

The review of literature thus shows that the PDD of a CoP within organizations deserves more attention. Lampel and Bhalla (2007) suggest that researchers and practitioners should acquire a deeper understanding of how CoPs are translated from one context to another. For instance, CoPs and Mintzberg's seminal work on organizational configurations (1980) have never been considered in relation to each other. Therefore, the articulation between a purposefully designed CoP and the organizational mechanisms that surround it remains under-explored. The present qualitative, interpretative study seeks to bridge this gap by answering the question: What are the dynamics of a CoP's PDD in a professional bureaucracy?

4.3 METHOD

The organization we studied was one of the most prominent labor unions in Canada, which we will call "LU." Almost 100 years old, LU has over 300,000 members within close to 2,000 local

unions in both the private and public sectors. Dispersed over 5,000 workplaces, the local unions are organized according to their sector of activity and their region. LU's strategic decisions are taken by top managers, who the LU's members elect to the executive committee. Additionally, the most pressing issues that the organization has to address are decided by an explicit decision-making body. In keeping with the labor union norm, LU is a professional organization with highly bureaucratic processes (professional bureaucracy). Following Mintzberg's work on organizational configurations (1980), LU relies on a balance between the standardization of skills, training, and indoctrination. As is often the case with organizations in silos, knowledge sharing has become a well-recognized issue.

Inspired by conferences about the "learning organization" concept, knowledge-sharing issues were discussed during a central get-together organized in April 2009. It was agreed that changes had to take place to allow knowledge to flow through LU's many structures. In November 2009, the executive committee decided to experiment with the CoPs approach. It was decided that the theme of the CoP ought to be sustainable development – referred to here as the CoP in sustainable development (CoPiSD). The theme was deemed appropriate because it concerned all LU's branches and had the potential to provide the sharing of best practices, and the creation of knowledge leading to innovation.

4.3.1 Phases in the research

The CoPiSD adventure lasted 16 months from the decision to try the CoPs approach to its forced termination due to failure. This timeline included its design period, official launch, and activities.

For data collection and analysis purposes, we divided this timeline into three distinct periods: (1) pre-CoPiSD, (2) CoPiSD, and (3) post-CoPiSD, as shown in figure 5.
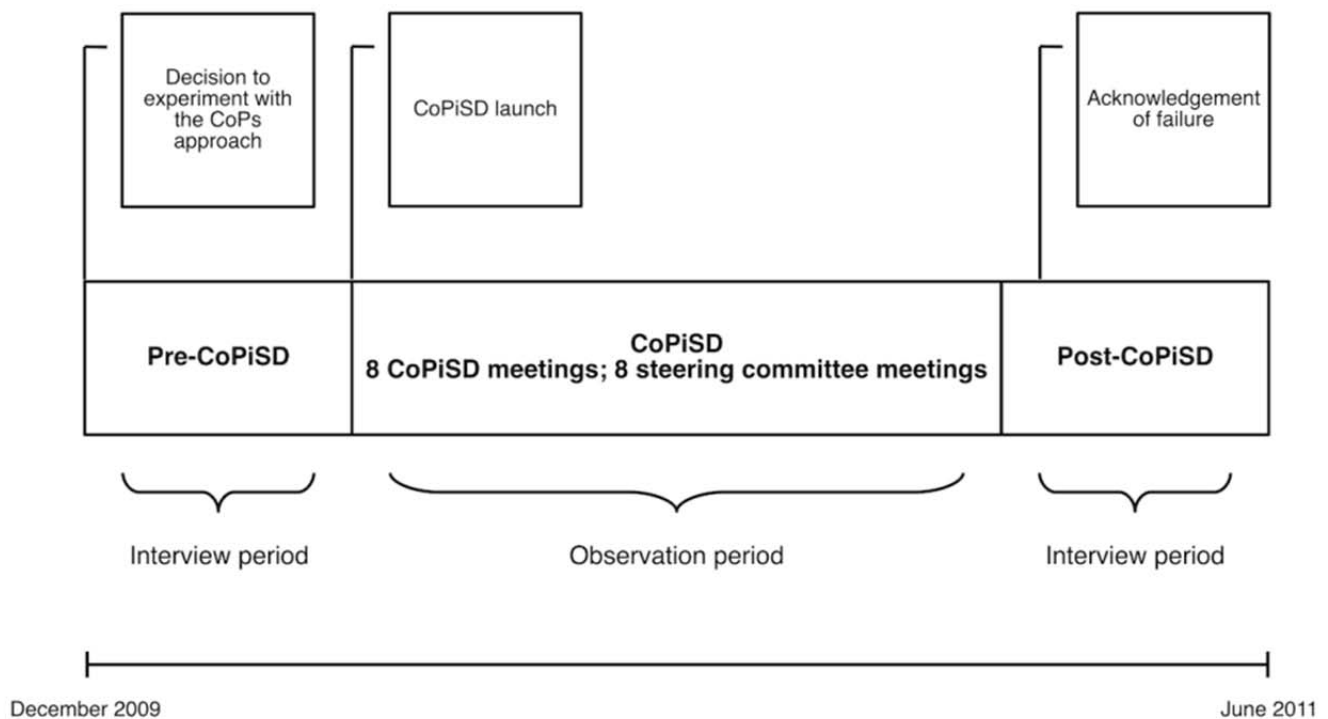
Figure 3 – Timeline of CoPiSD

The design of the CoPiSD involved the identification of a sponsor – one of the executive committee members – whose role was to provide resources, supervise CoPiSD activities, and serve as a link between the CoPiSD and the head of LU. It also involved establishing a steering committee – comprising a facilitator, a content expert, and a secretary – which selected the members. Employees who had shown an interest in sustainable development in the past were contacted and allowed to accept the invitation to join CoPiSD

The CoPiSD meetings took place every five or six weeks (with breaks for Christmas and the summer vacation) and lasted for five or six hours with a break for lunch. The steering committee, which met a day before every CoPiSD meeting, organized (and analyzed) all of these meetings. Slightly more than a year after the CoP's birth, the steering committee came to the conclusion that the model was not appropriate for LU and deemed it a failure.

Our entry into the organization occurred in the pre-CoPiSD period and lasted until the conclusion of the CoPiSD period. As shown in figure 1, we returned in the post-CoPiSD period to conduct interviews for a better understanding of what had happened. Using the data collected throughout the three phases of research, we carried out a longitudinal study on the dynamics of the PDD of CoPiSD.

4.3.2 Sampling

The sampling of our study was purposeful and everyone approached for an interview agreed. We sought to collect data from informants directly involved in the CoPiSS design and development process. Because of their prominent role in the initiative, we started with the members of the steering committee and then turned to the CoPiSD members. We collected perceptions and ideas from those members who showed differences in their participation levels in order to achieve maximum variation sampling, thus eliciting as broad an understanding of the phenomenon under study as possible (Patton, 2002). In other words, we interviewed members who attended most of the meetings as well as members who attended only a few of the meetings. Finally, following Glaser and Strauss's (1967) guidelines, we pursued data relevant to the themes emerging from the comparative analysis of the collected data until we reached theoretical saturation, or what

Lincoln and Guba call "the point of redundancy" (1985: 202). Because the last few interviews provided us with narratives similar to those we had previously heard as well as to data collected through observation and/or documentation, the theoretical saturation point seemed to have been reached. Indeed, after two thirds of the employees involved in the CoP under study were interviewed, new insights or refinements into the subject of CoPiSD's PDD were no longer gained and, therefore, had been substantially explained.

4.3.3 Data collection

Four techniques were used to collect data: (1) semi-structured one-on-one interviews, (2) documentation, and (3) non-participant observation. We relied on the interviews as the main source of data on the CoPiSS design and development process. The observation and documentation data served as important triangulation and supplementary sources to deepen our understanding of the context under study, to build a relationship of trust with the informants, and to improve the design of the interviews by ensuring the cultural relevance and appropriateness of the questions, follow-up questions, and probes.

4.3.4 Semi-structured interviews

We conducted two series of in-depth interviews with informants involved in the CoPiSD during the pre and post-CoPiSD periods. The lead author conducted all the interviews, which lasted 30-60 minutes, to maintain consistency. The first series of interviews involved questions about the informants' background, their thoughts regarding the union and its context, the then current knowledge-sharing obstacles, and their perceptions of the impending CoPiSD initiative. The second series of interviews were initially centered on the overall design process of the CoPiSD,

the informants' appreciation of this knowledge-sharing means, and its outcome. We thereafter progressively emphasized the emerging data structure while attempting to identify patterns across the informants. This also served to validate some of our field observations and it allowed us generate sound knowledge not only of the PDD process and outcome of the CoPiSD but also of why and how the outcome is shaped by the process.

We conducted 29 interviews with 17 different informants involved in the CoPiSD initiative, as detailed in table 1. We interviewed all the members of the steering committee and a majority of the CoPiSD members at least once. All but six interviews were audio-recorded and transcribed after each interview was completed. The six non-recorded interviews were spontaneous interviews with key informants during which we took detailed notes as soon after the interview as possible.

4.3.5 Documentation

We collected data from documents relating to the CoPiSD. Most of these documents were the steering committee members' records/proceedings of the CoPiSD's design and development. This allowed us to learn how matters were portrayed at LU. It also served as a stimulus for paths of inquiry that could be pursued through the interviews conducted in the post-CoPiSD period.

Qualitative Details of the Interview Data			
Informant and Role within CoPiSD	Interview in Phase:		
	Pre-CoPiSD	**CoPiSD**	**Post-CoPiSD**
CoPiSD sponsor	1		
CoPiSD facilitator	2		2
CoPiSD content expert	1		1

CoPiSD secretary	1	
CoPiSD member	1	1
CoPiSD member	1	1
CoPiSD member	1	1
CoPiSD member	1	1
CoPiSD member	1	1
CoPiSD member	1	1
CoPiSD member	1	1
CoPiSD member	1	1
CoPiSD member	1	
CoPiSD member	1	
CoPiSD member	1	
CoPiSD member		1
CoPiSD member		1

Table 1 – Details of the Interview Data

4.3.6 Observation

Finally, we engaged in direct, non-participant observation to gather potentially insightful data pertaining to the design and development process of the CoPiSD. As proposed by DeWalt and DeWalt (2002), our observational role consisted of standing back to permit systematic observation of the group processes and to note instances of the development of a CoP (mutual engagement, joint enterprise, and shared repertoire) or the lack thereof. We collected field notes and developed analytical memos as the fieldwork progressed. All the CoPiSD meetings and steering committee meetings were attended. We combined all of our data (interviews, documents, and observation field notes) to construct the narrative of our findings.

4.3.7 Data analysis

We began the analysis by coding a large number of "incidents" from the first set of collected data – naming, comparing, and memoing – very openly (Locke, 2001). We conceptually labeled parts of the data of each of the interviews as closely to the original wording as possible and grouped them into categories. These categories were modified and clarified before they were organized into sets that served as a meaningful picture that provided vivid information from the informants' perspective (Glaser and Strauss, 1967). This is where patterns started to emerge and most categories could be consolidated in higher-order themes. We constantly revised and compared the themes as we progressed until redundancies related to the content were eliminated.

Similar themes were then aggregated into several main dimensions that formed the basis of the emergent framework, allowing processual analysis in terms of "a sequence of individual and collective events, actions, and activities unfolding over time in context" (Pettigrew, 1997: 338). In search of new data relationships, those themes were emphasized even more throughout the data collection process, which stopped when the interviews brought little or no new information. By the end of the data collection process, each concept was captured in a short descriptive sentence and grouped into categories, which were consolidated in higher-order themes and aggregated into three different dimensions: the CoP design context, the CoP development context, and the stakeholders' response to contexts clash. The analysis is summarized in Appendix 1.

4.4   COP DESIGN AND DEVELOPMENT EFFORTS AT LU

As illustrated in figure 6, the model that emerged from the design and development process of the CoPiSD has three main dimensions: (1) the CoP design context, (2) the CoP development context, and (3) the stakeholders' response to the stacking contexts clash. Inspired by Corley and Gioia's efforts to offer the reader the possibility to "quadrangulate" the evidence of their findings (2004), we have combined four data displays: (1) the findings narrative itself, (2) the progressive data structure in Appendix 1, (3) the emergent model in figure 2, and (4) additional supporting data in Appendix 2.

4.4.1 CoP design context

Two specific themes relating to the origins of the CoPiSD were identified: (1) the identification of knowledge-sharing needs and (2) the recognition of the potential associated with the CoPiSD.

4.4.1.1 Knowledge-sharing needs identification

The creation of the CoPiSD was triggered by the identification of knowledge-sharing needs throughout the organization. Many of our informants felt that more knowledge should flow between those working in similar environments and on related tasks. One noted: "I would like to learn from what my colleagues are doing in sustainable development with other unions in comparable situations but for whatever reason it doesn't happen" (CoPiSD member). Others were more concerned with the high number of their peers nearing retirement and the lack of intergenerational knowledge transfer activities. Our informants also felt that they were very isolated due to their work location. One of them mentioned: "You know, LU covers quite a large territory. I can't take a plane every time I feel like meeting with someone from whom I could

learn something. So, I call people up or I email them, but it's hard to keep in touch this way"

(CoPiSD member).
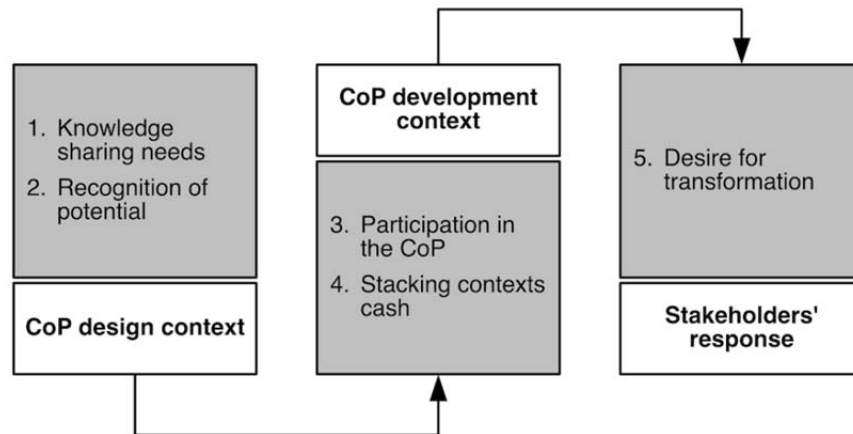
Figure 4 – CoP PDD process

4.4.1.2 Recognition of potential

To meet the above challenges, LU decided to opt for the CoPs approach. Our informants

appeared extremely motivated and recognized the potential associated with this way of

knowledge sharing and creation. Their motivation was twofold. First, they were motivated

regarding the opportunity to share knowledge on sustainable development. One of them stated: "I

look forward to being part of this initiative. I think sustainable development needs to be at the

forefront of a broader movement to reassert the value of our organization" (CoPiSD member).

Second, our informants' motivation came from the opportunity to bypass communication silos

and learn directly from their colleagues' experiences. Building new relationships and

strengthening old ones appeared critical to them: "I think I'll be able to do my job better because

of the direct access I'll have to the knowledge of more people passionate about the same

questions as I am" (CoPiSD member). In the end, our informants were very pleased to participate in the CoPiSD.

4.4.2   CoP development context

Two specific themes relating to the development of the CoPiSD were identified: (1) the actual participation in the CoPiSD and (2) the clash between the organizational context and that of the CoPiSD.

4.4.2.1 Participation in the CoP

Of the 21 employees who accepted the opportunity to participate in the CoPiSD, 14 showed up for the first meeting. The sponsor gave a short presentation to put the initiative in perspective before everyone introduced themselves. The group then tried to establish the CoPiSD's mission. They were, however, unable to take a clear position, but they agreed on a modus operandi with members giving presentations on the current LU practices. According to them, this was to encourage knowledge sharing and creation. Finally, a knowledge management platform with knowledge repositories and a discussion forum was presented to the group and everyone was invited to create their profile, to introduce themselves and to use it to share knowledge between meetings.

As illustrated in figure 7, a total of eight meetings took place with varied participation levels. A total of 15 presentations were given on the current and late sustainable development practices.
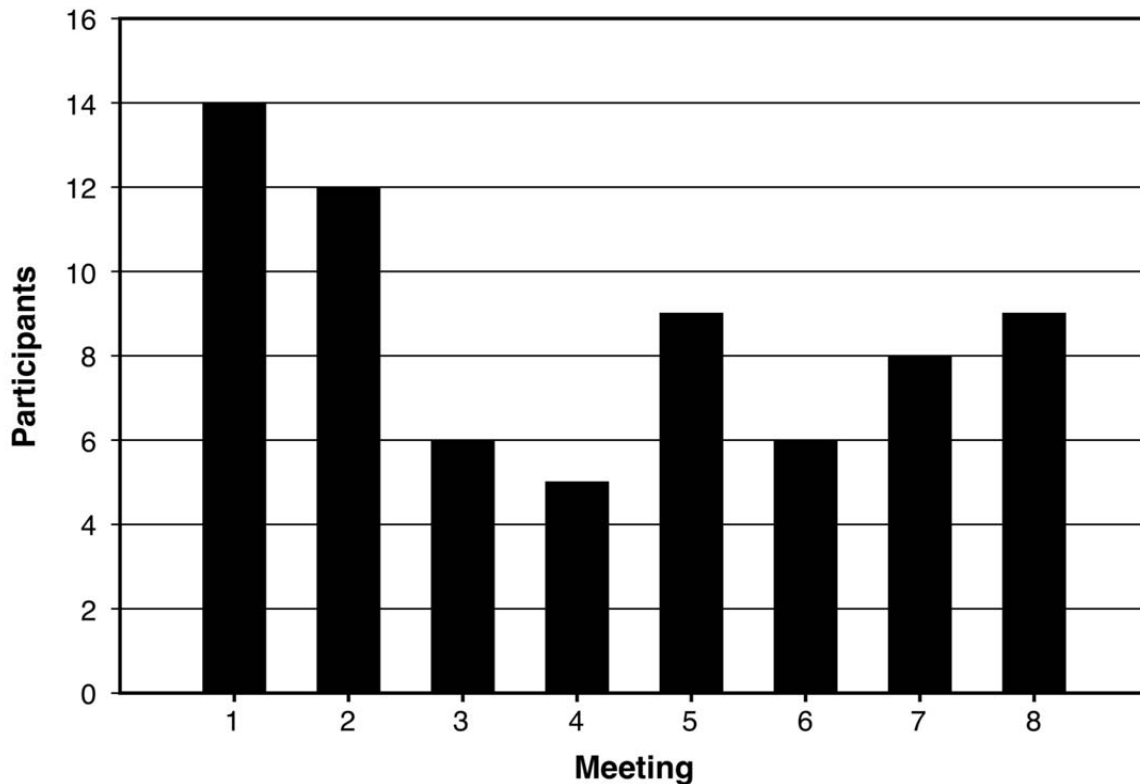
Figure 5 – CoPiSD's Participation

These presentations followed a formal structure: a PowerPoint presentation and a Q&A period. Unfortunately, with the exception of a few presentations, the discussions rarely got off the ground. The facilitator found it difficult to motivate discussions during meetings and exchanges between the meetings were negligible. There were very few spontaneous exchanges on topics triggered by the members' interests. One informant explained: "I couldn't tell you that our meetings were dynamic and messy. Honestly, it should be more than a dry as dust occasion during which practices are presented. It should be more of a dialogue. More ideas should be exchanged" (CoPiSD member). Another stated: "We see interesting presentations, but I wonder what we should do with these. Some of the members don't seem very passionate and I'm not sure how to turn them on" (CoPiSD facilitator). Minimal activity took place on the knowledge

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management platform: a few members introduced themselves but it was mainly used as a repository for the PowerPoint presentations that were given during meetings.

4.4.2.2 Stacking contexts clash

The steering committee spent a considerable amount of time encouraging the members to present practices but they felt that they lacked formal authority. "Sometimes we know that a particular member could present very interesting stuff. We contact him and invite him to prepare a little something but then this person does not feel like it. What can we do then? Nothing. So we turn to somebody else" (CoPiSD content expert). The facilitator had a few issues with her role as well. She found it "ill-defined" and would have appreciated more guidelines, like the other responsibilities that she assumed at LU. She was afraid of being too authoritarian with the members and lacking the formal power that the organization could have given her. Without this formal power, it was difficult for her to get the members to work together. Yet, the steering committee kept the CoPiSD alive in the hope that the members would take the reins.

The members were also confused about their role and responsibilities in relation to the CoPiSD. First of all, they did not know how to behave during the meetings. One of them explained: "It is unclear how I should act when I get there. Do I represent my union or the whole organization? Or do I go there simply as someone who is interested in sustainable development?" (CoPiSD member). The vagueness, as they called it, associated with their activities in the CoPiSD did not merge well with their daily routine, where their role and responsibilities were precise. One of them stated: "Nothing is clear-cut with the CoPiSD. I don't know how it is supposed to be." (CoPiSD member) This ambiguity also had an impact on the most passionate

members: "I would like to do more for the CoPiSD but I'm not sure what and how to do it" (CoPiSD member). Indeed, most aspects of the LU's planning and operations were defined by explicit rules and norms. Therefore, while specialists and professionals worked relatively independently of their colleagues – but closely with their clients (union's members) – they knew what to expect from them. Contrary to the CoPiSD's activities, LU's authorities took care of the generation and application of rules for encoding knowledge and for monitoring compliance in order to ensure rather unified and predictable behaviors and outputs. Everyday activities were hence restricted by formal affiliation and accountability structures.

Although the CoPiSD members showed a desire to share knowledge about their practice and learn about sustainable development in order to innovate, they had difficulty adapting to the CoP context. Both the steering committee and the members very quickly started to worry about the CoPiSD's outcome. While they all agreed that it was necessary to share knowledge to improve the practices in place, both parties were impatient to make the CoPiSD's mission explicit. For instance, on numerous occasions they discussed the clear objectives that had to be pursued yes they felt it lacked an identified structure to make such decisions. In addition, the CoPiSD's legitimacy was sometimes questioned due to its informal nature, which did not bode well within an organization where formal procedures are ubiquitous.

4.4.3   Stakeholders' response

The stakeholders' response to the PDD of a CoP within LU can be defined as a strong desire for transformation. As illustrated below, this desire was by both the steering committee members and the CoP members.

4.4.3.1 Desire for transformation

Faced with much ambiguity regarding the CoPiSD's inner functioning, the steering committee and the members had to reevaluate its relevance. All of our informants reacted strongly when asked about the CoPiSD's future in respect of its need for more structure. One informant explained the consensus: "The CoP is not a bad idea. It just needs more structure. We have to produce something from those meetings" (CoPiSD content expert). According to our informants, the CoPiSD had to be modified and turned into a work group with assigned roles, clear tasks, and known responsibilities: "We have to find a work plan that addresses identified issues at LU. Our activities ought to appear legitimate in the eyes of the organization" (CoPiSD member).

Overall, this study covered 16 months in the life of LU where efforts to purposefully design and develop a CoP were deployed. On the whole, the data suggest that the study tracked a bona fide failure to implement such a means of knowledge sharing and creation within a professional bureaucracy.

4.5   DISCUSSION

The purpose of this study was to better understand the dynamics of a CoP's PDD in a professional bureaucracy. Here, the study shows that a bureaucratic environment can hamper the PDD of this knowledge sharing means. Our results offer scope to examine causal processes directly, to look at them in context. In this sense, the findings provide a starting point for theoretical development by explicating the emergent clash between the professional bureaucracy context and the one needed for CoPs; a clash generated by fundamental divergences between two conflicting entities forced to co-exist. This leads us to inquire into the vision of CoPs within

organizations. CoPs may in fact represent a social phenomenon rather than an organizational learning tool.

4.5.1 The clash between two systems

Our results show that the highly informal degree of the interactions that took place within the CoP was new to the professional bureaucracy employees. In such, they reacted strongly to the "vagueness" associated with the CoP activities. Also, they felt a deep and lasting malaise regarding the absence of guidelines and an inability to venture beyond their beaten paths. On the one hand, the bureaucratic environment guided them into action; it allowed them to act, to be. On the other hand, the self-determination associated with the CoP paralyzed them. While our case study shows that the CoP members were in favor of the PDD of the CoPiSD, we observed that the "mathematical" approach that this professional bureaucracy suggests disheartens its employees when they face the challenge of autonomously creating new mental structures, new constellations for knowledge, experiences, and ideas to be shared and created. Instead of being stimulated by vague and loose structures, the professional bureaucracy employees showed an intolerance of ambiguity and were incapable of taking control in unstructured situations. The LU employees' everyday activities had always been governed by a clear set of formal rules and recognized norms. Therefore, the lively freedom inherent to CoPs did not resonate with the members' normal behaviors, which are shaped by the crystalline cage that is a professional bureaucracy. Put differently, the CoP challenged the professional bureaucracy's modus operandi and led to those involved experiencing a significant clash.

For it now seems that LU's organizational configuration was a poor fit with the context required for new knowledge – produced within and outside of CoPs – to emerge. At this stage it appears desirable to investigate this antinomy further. Nonaka and Takeushi's (1995) five conditions for knowledge creation at the organizational level – intent, autonomy, fluctuation, redundancy of information, and requisite variety – provide a lens through which professional bureaucracies and CoPs can be examined. While it can be argued that LU's configuration allows for a strong organizational vision to be communicated (intent), its hierarchically prone and controlling nature does not allow self-organized groups to thrive (autonomy). And whether this strong vision will, in turn, lead to significant individual commitment is also very questionable. Obsessed with stability, this professional bureaucracy is just as unlikely to encourage ambiguity, crisis, and chaos – although necessary for knowledge creation – and run the risk of disturbing its well-oiled disciplined structure (fluctuation). Turbulence was by no means seen as an opportunity for organizational learning. Moreover, if job rotation is said to be a facilitating condition for redundancy of information to emerge, professional bureaucracies such as that at LU are, on the other hand, deeply grounded in the principles of job division. Undoubtedly, the lack of a shared general knowledge proved to be a serious handicap at various stages of the CoPiSD.

Finally, the LU case clearly illustrates that this specific organizational configuration is at odds with the idea of having on-demand knowledge made available to all. Professional bureaucracies' cogs are not only highly standardized, but their guiding principles make it very laborious for any employee seeking to tap into other existing knowledge that may exist within the organization (requisite variety). This analysis is summarized in table 2 below.

Configuration	Enablers	Intent	Autonomy	Fluctuation	Redundancy of information	Requisite variety
Professional bureaucracy		High	Low	Low	Low	Low

Table 2 – Knowledge creation enablers in professional bureaucracies

When confronted with this clash, the employees responded by adapting the CoP to the routines they acquired throughout their working life at LU. Their ways of doing things have become institutionalized within routines (Nelson and Winter, 1982). For instance, instead of holding dynamic and interactive gatherings during which errors could be discussed, hot topics debated, new ideas presented, and reality questioned, the CoP members turned these meetings into information deliveries. The group failed to engage in productive dialogue (Tsoukas, 2009) and lost cross-fertilization possibilities. Consistent with the work by Ardichvili et al. (2006), the study shows that a bureaucratic environment can hamper the PDD of this knowledge sharing means. It also supports the point of Roberts who suggests that "communities of practice may be better suited to harmonious and trusting organizational environments in which workers are given a high degree of autonomy." (2006: 629).

The context in place transformed a learning experience into an administrative governance experience, which is contrary to the CoP concept. Everyone needed to know what was expected of them and the CoP activities had to be strictly planned and organized. A rational, systematic, achievement-oriented culture prevailed with an administrative functioning style that stressed systems, procedures, and goals. As suggested by Lampel and Bhalla (2007), tensions surface

within organizations when knowledge management practices operate within a rational view framework in spite of their ostensive advocacy of a natural view approach. In the end, the fundamental predispositions for the development of CoPs were not at the rendez-vous, but the expectation of results was.

4.5.2   CoPs: a social phenomenon?

LU's organizational configuration appears to have had a major impact on the PDD process of CoPiSD. However, the process itself is also very questionable. Though the field of knowledge management has discovered CoPs as a practical way to manage knowledge by providing "a concrete organizational infrastructure for realizing the dream of a learning organization" (Wenger et al, 2002: x), our findings show that this knowledge sharing strategy may not be deliberately planned and configured, so the stakeholders will have a direction and therefore act rationally. While various researchers and practitioners assert that the CoPs approach can be applied in a wide range of organizational settings (e.g., Roberts, 2006; Wenger et al., 2002), this study points to the danger of professing a faith which is empty of real content and devoid of its proper nature. Lastly, we take issue with the ever more instrumentalist use of CoPs. There is a need to refocus the CoPs approach as a social phenomenon instead of an organizational learning tool.

Our findings indicate that the distinctive insights of original CoPs thinking are to be blurred if organizations lose sight on the naturalness associated with the development of a community around a shared practice. Indeed, this study exemplifies how an organization may fall for the appeal of "community", which tends to obscure the importance of "practice" (Brown

and Duguid, 2001a). Seeking to maximize learning and knowing in order to generate innovation, LU asked employees who normally operate in an individualistic fashion to produce organizationally advantageous knowledge through their participation within a CoP. However, organic entities like CoPs are developed through a process of social evolution and constant negotiation, not through deliberated obedience.

LU admittedly created a community, but not a CoP. Our results show that the qualities that make a CoP an ideal structure for learning – namely a shared perspective on a domain, trust, a communal identity, longstanding relationships and an established practice (Wenger et al., 2002) – cannot be designed. In other words, the case-study supports the argument of authors who argue that CoPs are not programmable but largely emerge spontaneously over time (e.g., Brown and Duguid, 1991; Cox, 2005; Duguid, 2008; Gherardi and Nicolini, 2000; Lave and Wenger, 1991; Raz, 2007). It is the extent of trust and reciprocity in relationships that create a social context where individuals who share a concern or a set of problems intuitively learn from one another how they can proactively establish a viable course of action around their practice as well as how they can reactively adapt to unfolding circumstances. As illustrated by Lave and Wenger (1991), this process takes time. In fact, according to Willem and Scarbrough (2006), social capital does not operate in a purely instrumental way, which could limit knowledge flows.

As illustrated by this study, CoPs cannot be deliberately planned and configured. The proper features – namely mutual engagement, joint enterprise, and shared repertoire (Wenger, 1998) – need to be in place. Since LU's steering committee generated the members' mutual engagement in the CoP artificially, its lack of sustainability should not come as a surprise. The

members kept looking for a distinctive title or a formal position to lead and oversee their interactions within the CoP. A rule-based view prevailed. This shows the professional bureaucracy as a "planned system of cooperative effort in which each participant has a recognized role to play and duties or tasks to perform" (Simon et al., 1961: 5). Unlike the spontaneous CoP of technicians at Xerox (Orr, 1991), the CoPiSD members were unable to progress by collaboration, improvisation and bricolage. The absence of a truly mutual engagement resulted in the members' inability to negotiate and engage in a joint enterprise which should have defined their shared repertoire. Without these three key interconnected features, the CoPiSD could not develop into a successful CoP. In the end, it led to a poor knowledge network that could not support the sharing and creation of knowledge.

4.5.3   Implications for practitioners

These contributions to the knowledge management literature have important implications for business practitioners. First, this study shows that fluctuations and creative chaos can be quite incapacitating for professional bureaucracy employees when they are suddenly confronted with these. In order to innovate through the sharing and creation of knowledge, professional bureaucracies must ensure that their staff does not become too comfortable with the formal procedures, practices, and technical standards that are in place. To this effect, our results point toward the need for professional bureaucracies to ensure that employees' habits, organizational routines, as well as their cognitive models are significantly altered from time to time so that stability and comfort do not become the norm and their point of reference.

Second, organizations interested in creating value and improving performance through the sharing and creation of knowledge may look for pre-existing social networks for the development of CoPs. Nurturing and expanding existing networks into CoPs might be easier than establishing new ones. As suggested by Brown and Duguid (2001b), managers may seek to structure spontaneity in order to attain this end. In the long run, organizations must allow CoPs to grow naturally and sustainably instead of pushing for their development. Indeed, the PDD of CoPs is in contradiction with the spontaneous participation that it hopes to ignite. In this regard, practitioners can refer to Cherns (1976; 1987) who showed that the design of any change must be consistent with its objectives. Thus, it is unrealistic to believe that managers can introduce bottom-up participation and give power to employees of the base in an authoritarian manner through a top-down initiative.

Specifically, it appears important to re-emphasize the design process of the CoP under study and stress that all members were recruited by the steering committee. They were then gathered and invited to take advantage of this opportunity to share knowledge on sustainable development. While employees might be interested in developing knowledge around their practice individually, it does not mean that they are both willing and ripe enough to do it collectively. CoP's members must first find each other and discover their commonalities before actually investing time and energy to share and create knowledge together. They need to learn to know each other to identify and promote their convergent interests, not the other way round. In this sense, it seems rather unlikely that a steering committee can purposefully design a CoP if the members have yet to recognize their collective potential.

So if managers in professional bureaucracies cannot purposefully design and develop CoPs, what can they do? We argue that they remain in a great position to facilitate the emergence of CoPs by providing projects and events that allow for the repeated interactions necessary to create common references between employees as well as for the construction of much needed trust and reciprocity in relationships for knowledge to flow more easily. Once the building-blocks for enduring relationships have appeared, managers may nurture the CoPs' development with spaces and places that encourage reflexive and reflective thinking by exploring the collective cognitive structures in relation with the given practice. For instance, working on a mutual project allows employees to become engaged by doing things together, talking and producing artifacts. Managing for CoPs to emerge must become a matter of casting the right people on the right projects, employees seen as knowledge sharing and creation champions should be given the chance to interact on a regular basis.

In addition, joint participation in an event allows employees to reflect on their situation and envision themselves in the world through imagination. For the cake to rise, experienced managers who are aware of who knows what or of the passion of various employees may then play the role of connectors (Hansen and Nohria, 2004). Besides, starting small should not be seen as a drawback since it could very well allow CoPs to grow naturally and sustainably. In this way, a community could more easily self-organize its activities. Fostering social capital among employees should provide the foundations from which CoPs can emerge or for designing CoPs more smoothly.

Once the idea of a CoP has gelled, managers must support it by aligning its activities with processes as they evolve to maintain efficiency. This means providing spaces and places. First, spaces offer the opportunity to make local knowledge global by eliciting the right questions and stimulating productive dialogue on important issues to the members' practice. Doing so fuels the cognitive desires of each member and leads to inspired discussions which provide the basis to develop a shared repertoire. Second, places for the CoP's members to meet formally as well as informally, or spontaneously, in order to exchange ideas freely but also to identify best practices within their domain. In other words, they need to multiply occasions where employees can come together around a given practice. Besides, such places should serve to publicize the benefits that bring the CoP. Advertising the good shots of the members, the time saved due to knowledge sharing activities or other added value the CoP brings to the organization. In any case, the promotion of knowledge sharing should never be the work of one person, one community or one department. Ideally, throughout the organization, champions at different hierarchical levels should be identified and empowered, so that they can in turn communicate the benefits of knowledge sharing and creation.

On the whole, managers must find ways to cultivate a sense of belonging among various employees within a collective environment. A CoP should be kept alive because of its members' activities, rather than because of a steering committee's desire. It is therefore essential for employees who value the existence of the CoP to be at the heart of its design and development.

4.5.4   Limitations and future research

This longitudinal case study was set up to explore from a processual perspective the PDD of a CoP, which was lacking in the literature. We did, however, only study one professional bureaucracy. Although this is a standard bureaucracy, the research was designed to be exploratory and, as is always the case with single case-studies, the results may not be generalizable (Yin, 2009). The findings should therefore not be taken as either exhaustive or conclusive.

Further research is needed to ascertain if the CoPs approach is only suitable for specific organizations and not for others. According to our results, the professional bureaucracy hampers participation in purposefully designed and developed CoPs. This opens the door for a comprehensive research on CoPs in organizations in terms of all organizational configurations identified by Mintzberg (1980). Comparing the patterns in the process of a CoP PDD in terms of shape, character and incidence in various organizational configurations could lead to significant theoretical development. What is known about the PDD of CoPs is still limited due to the research designs used in most studies in this domain, and particularly the lack of longitudinal approach emphasizing the importance of the context instead of a few selected internal aspects. This study goes some way towards redressing this imbalance, but more work is needed on CoPs within organizations. Such studies could contribute to the development of more appropriate knowledge management practices.

4.6   CONCLUSION

According to Amin and Cohendet, "radical innovation occurs through engagement and enactment and through the alignment of elements in a new script of organizing and acting"

(2004: 79). While CoPs represent one of these new scripts, they seem particularly difficult to nurture in professional bureaucracies. At the same time, just as there are dangers associated with bringing new scripts into the world of professional bureaucracies, there are equally significant dangers associated with not having them on the management radar screen. In the end, the PDD of CoPs represents a bigger challenge for professional bureaucracies. Failing to recognize the above-mentioned hurdles will most likely leave them quite short of the expected benefits of such initiatives. Nevertheless, the PDD of CoPs may create ties that will be profitable in the long run for the organization.

Appendix 1 Data structure

- Loss of knowledge when someone retires.
- Much time is lost repeating what others have done before.
- We don't know what others do.

→ Identification of Knowledge Sharing Needs

- Knowing more of what is happening should serve us well.
- A place where to exchange what we know and do should be useful.

→ Recognition of Potential

CoP Design Context

- Not everyone comes to the meetings.
- Most of us are too passive during meetings.
- There is an agenda with presentations from members and we follow it.

→ Participation in the CoP

- Who do we represent in the CoP?
- The purpose of what we do is not clear.
- Emerging tensions with the vagueness associated with the CoP activities.

→ Clash of Stacking Contexts

CoP Development Context

- Growing sense of a need for structure, clear roles, and responsibilities.
- There has to be more decision-making and more action.

→ Desire for Transformation → Stakeholders' Response to Contexts Clash

Appendix 2 Additional supporting data

Data supporting interpretations of purposeful CoP design and development	
Theme	**Representative quotations**
	CoP creation context
Knowledge-sharing needs identification	"I try to make sure that every local union I work with is aware of what is done in other local unions, but it's quite difficult." (CoPiSD member)
	"We often find ourselves reinventing the wheel… it takes me 10 to 15 calls before I know if something similar to what I am planning to do has been done before." (CoPiSD member)
	"There is virtually no knowledge transfer when someone takes over someone else's job. The most significant support I have received in this sense was a telephone conversation that lasted for a few hours." (CoPiSD member)
	"Knowledge sharing is a big issue. Many of the unions do not instinctively communicate what they're doing in order to avoid others doing the same work twice, for example." (CoPiSD sponsor)
Recognition of potential	"The community is a great idea! We don't have any place where best practices can be shared. A lot of knowledge relevant to my work is not written down anywhere." (CoPiSD member)
	"My current circumstance often has me working in isolation from the rest of the organization. I look forward to meeting with people who have that interest in sustainable development." (CoPiSD member)
	"From what I have heard, the community of practice should be very interesting and refreshing!" (CoPiSD member)
	CoP development context
Participation in the CoP	"We talk about what has been done in sustainable development. I would not say that there are real hard debates or that we exchange a lot of new ideas, but we have presentations and discuss them." (CoPiSD member)
	"In my opinion, most of us are a bit too passive. It seems like we are still learning how it should work." (CoPiSD member)
	"We have an agenda and we follow it. Usually, colleagues or outsiders do presentations." (CoPiSD content expert)
	"To be honest with you, I would like to see more participation by the members. I feel like I always have to push some of them to enter the conversation." (CoPiSD facilitator)

Data supporting interpretations of purposeful CoP design and development	
Theme	**Representative quotations**
Stacking contexts clash	"It is unclear how I should act when I get there. Do I represent my union or the whole organization? Or do I go there simply as someone who is interested in sustainable development? That's not easy to ascertain." (CoPiSD member)
	"I feel like we need to have a clear purpose and to know where we're going with all this because right now, you go to meetings and we know we will have presentations, but it is unclear what will happen with those or why we even spend time on those presentations. You know… what's the bottom line? I know we must share what we know, but what we do after that is not clear." (CoPiSD member)
	"There is another group, with elected participants, that has to complete studies and make recommendations regarding sustainable development issues… we have to find a way to not interfere with what they do." (CoPiSD facilitator)
	"I'm not sure what to think. To be honest, I find it difficult... we are immersed in vagueness. You get there with the idea of sharing what we know but at the same time we know so much; we do not know where to start." (CoPiSD member)
	"There has been many questions about what we should do, what we wanted to do, and how we could best make a contribution... but we still find ourselves asking the same questions... it seems like we can't find our path, the right one to take." (CoPiSD member)
Stakeholders' response	
Desire for transformation	"We need more structure and decision-making. The exchanges are interesting but they do not always lead to concrete action. We need someone who makes the decisions, who will say *this is what we'll do* and makes us do it." (CoPiSD member)
	"We need to move away from the discomfort with regard to the constant vagueness of the CoPiSD. We need a clear project, with members identified to fulfill clear roles and responsibilities." (CoPiSD facilitator)
	"The most beneficial would be to have our own projects, to organize ourselves to make more things happen in sustainable development at LU. But that might go beyond the purpose of the community of practice… I don't know." (CoPiSD member)

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CHAPTER FOUR – FOURTH PAPER

MANAGING ORGANIZATIONAL MEMORY WITH INTERGENERATIONAL

KNOWLEDGE TRANSFER

Abstract: The purpose of this paper is to provide the systematic analysis of an innovative, intergenerational knowledge transfer strategy in a knowledge-intensive organization. A case-study method – non-participatory observation, focus groups, documentary analysis, and semi-structured interviews – was adopted to study the intergenerational knowledge transfer activities. Two models for intergenerational knowledge transfer are presented: the source-recipient model and the model of mutual exchange. They provide a rubric against which both old and new intergenerational knowledge transfer initiatives can be assessed to determine whether they are capable of encouraging the transfer of both explicit and tacit knowledge. This research also shows how an overall context conducive to knowledge transfer was developed. Often ignored or underestimated it highlights the need for motivation, inspiration, and empowerment in knowledge transfer. Since there is little empirical work on the design and implementation of strategies for managing organizational memory, the integrated models and empirical findings of this study can serve as guides in that process.

3.1 INTRODUCTION

Employers in developed economies are facing a major issue: Their population is aging and a high proportion of their workers is set to retire, or at least radically rethink their participation in the labor market. The following is an illustration: In all projection scenarios selected by Statistics Canada (2010), the increase in the proportion of people aged 65 or older is set to continue in the coming years, with this group representing between 23% and 25% of the population in 2036, compared to 14% in 2009. Visibly worldwide (Bloom and McKinnon, 2010), this phenomenon is clearly reflected in the labor market. The baby-boom generation that followed the Second World War is currently becoming a large mass of workers accessing or approaching retirement. These figures are even more worrying when we consider that the median retirement age has fallen by three years – from 65 to 62 in 2008 – since 1976 (Pignal et al., 2010).

The great number of retired older workers is inevitably accompanied by a significant loss of knowledge (DeLong, 2004; Strack et al., 2008). Thus, "the problem won't just be a lack of bodies. Skills, knowledge, experience and relationships walk out the door every time somebody retires – and they take time and money to replace." (Dychtwald et al., 2004: 50) To combat the dangers of corporate amnesia, intergenerational transfer of knowledge is a matter of survival. Unfortunately, examples of successful strategies that address this issue are scarce.

In order to better understand how an organization addresses the needs for intergenerational knowledge transfer, the present study followed the implementation of an innovative strategy for late-career nurses (LCNs) and recruits (Rs) at La Pommeraie Health and Social Services Centre (LPHSSC). Launched in 2009, this strategy was recently identified as a

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Leading Practice by Accreditation Canada. It is particularly interesting to examine an environment where the need for an intergenerational transfer of knowledge is even more glaring. Among Canadian nurses, the group aged between 40 and 59 is predominant, amounting to 57.1% of all registered nurses, 54.1% of licensed practical nurses, and 62.1% of registered psychiatric nurses (CIHI, 2010). In addition, the majority of nurses historically enters retirement earlier than other workers (CIHI, 2010). Furthermore, "hospitals increasingly look like precursors of the knowledge-intensive organizations of the future." (Adler, 2003: 7) Thus, it is even more worth studying the mechanisms put in place in such an organization. This article offers a rare opportunity to transfer lessons on intergenerational knowledge transfer from a strategy that was deployed recently.

This research's key contribution is the systematic analysis of an innovative, intergenerational knowledge transfer strategy. More precisely, two models for intergenerational knowledge transfer are presented: the source-recipient model and the model of mutual exchange. This study also shows how a context conducive to knowledge transfer was developed, and concludes that this context allowed both explicit and tacit knowledge to be transferred. After reviewing the literature on knowledge transfer, the LPHSSC context is given before the details of the innovative strategy are explained. Thereafter the research methodology is presented, followed by the findings. Finally, the findings and their implications for practice and future research are discussed.

3.2   BACKGROUND

3.2.1   Dimensions of knowledge

Showing a multidisciplinary consensus, the two main dimensions of knowledge – explicit and tacit knowledge – were first introduced by Polanyi (1966) and then expanded by Nonaka (1994). Explicit knowledge is formal (rules, procedures, etc.) and easy to transfer in codified and formalized form without a loss of integrity. Since it is seen as an asset (Empson, 2001), explicit knowledge can be easily transferred from one actor to another and is often referred to as know-what (Brown and Duguid, 2001).

Conversely, tacit knowledge is personal, contextual, and incorporated in the memory of actors (Baumard, 1999; Tsoukas and Vladimirou, 2001). Adopting the "knowing as a process" perspective (Empson, 2001), Polanyi suggests that "we know more than we can tell" (1966: 4). Therefore, transferring and creating tacit knowledge requires physical interactions, since its formalization is demanding, sometimes impossible (Ambrosini, 2001), and, hence, difficult to communicate. As a social construct, tacit knowledge comprises each individual's technical and interpersonal skills (Cook and Brown, 1999; Nonaka and Takeuchi, 1995), as well as groups' synergies (Polanyi, 1966). Tacit knowledge is commonly called know-how (Brown and Duguid, 2001). Predominant in comparison to explicit knowledge (Bhardwaj and Monin, 2006), tacit knowledge specifically forms the background necessary to interpret and develop explicit knowledge.

However, one should not conclude that there is a sharp division between tacit and explicit knowledge (Kakabadse et al., 2003). Cook and Brown have shown that "each form of knowledge does work the other cannot" (1999: 384) and "each form of knowledge can often be used as an aid in acquiring the other" (385). Therefore, although the retrieval of expert tacit knowledge is

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considered quite difficult, knowledge management strategies must take both perspectives into consideration (Goh, 2002). Studies suggest that retrieving, codifying, and transferring tacit knowledge is well worth the effort (Kikoski and Kikoski, 2004). Among other things, it provides significant cost savings to organizations through improved know-how and increased innovation (Paik and Choi, 2005; Seidler-de Alwis and Hartmann, 2008). However, in spite of recent advances (e.g., Goh, 2002; Kakabadse et al., 2003; Lang, 2001), the dominant belief is still that knowledge can be codified, captured, and manipulated instead of, at its core, comprising the notion of individuals' interaction in which, as illustrated by Granovetter (1973), links or ties are considered the bridges by which knowledge transfer occurs between actors.

3.2.2 Knowledge transfer

The terms "knowledge transfer" and "knowledge sharing" are often used interchangeably and even to define each other. Wang and Noe posit that "knowledge transfer involves both the sharing of knowledge by the knowledge source and the acquisition and application of knowledge by the recipient" (2010: 117). This last stage (application) has been identified as most critical, requiring the recipient to show an adequate level of absorptive capacity to create value with the newly acquired knowledge (Alavi and Leidner, 2001; Cohen and Levinthal, 1990; Leonard-Barton, 1988). While it has been suggested that knowledge transfer is better realized through mutual exchanges than through a generic source-recipient model (Argote, 2005; Chini, 2004), most studies on the subject pertain to the latter – putting forward the mathematical theory of communication (Attewell 1992, Shannon and Weaver 1949, as cited in Szulanski et al., 2004)

Therefore, there is still today a lack of a proven best practice for knowledge transfer (Liyanage et al., 2009).

Several authors have studied the characteristics of knowledge in knowledge transfer activities and pointed out that knowledge tacitness hinders such process. Indeed, scholars (e.g., Inkpen and Dinur, 1998; Szulanski, 1996; Zander and Kogut, 1995) have identified that the degree of codification impacts the speed of transfer. Szulanski (1996) has demonstrated that tacit knowledge tends to stick in one place (i.e.: the mind of an individual) rather than flow from one to another. Nonetheless, the importance of tacit knowledge transfer in the health sector cannot be overstated (Williams, 2011). Hence, despite Robert et al.'s (2009) claim that health sector organizations need opportunities for reflection and learning at all levels, the literature on knowledge management has mainly addressed issues, challenges and opportunities for the private sector. Therefore, there is a major lack of strategies designed for the public sector (Cong and Pandya, 2003), and even more so for the health sector (Zigan et al., 2010). In this sense, the present paper seeks to bridge this gap.

Given that knowledge transfer is seen as one of the most important components in order to achieve the status of a learning organization (Easterby-Smith, 1997; Senge, 1990), the attention that leaders devote to this process has grown significantly in recent years (Smith, 2005). A challenge to both theory and practice (Scholl et al., 2004), knowledge transfer processes typically include interviews/videotaping, mentoring, storytelling, communities of practice, and training and education (DeLong and Davenport, 2003). Face-to-face interaction is one factor associated most often with successful knowledge transfer (e.g., Xerox's reps in Brown and

Duguid, 2000; Hewlett-Packard's engineers in Hansen et al., 1999) as it allows for productive

dialogue (Tsoukas, 2009). Those face-to-face interactions shaped through social relationship

linkages provide the framework in which individuals can create, retain, and transfer knowledge

(Argote et al., 2003; Nonaka and Takeuchi, 1995). For example, Hu (2005) notes that the

participants in a tacit knowledge transfer process emphasized the need for a case-by-case,

creative, and proactive people-based approach based on face-to-face interactions. Nevertheless,

how such an approach can be realized remains one of the main research avenues to be pursued.

3.2.3 The role of proximity in knowledge transfer

Employees sometimes consider knowledge transfer an extra-role behavior (Wang and Noe,

2010). Since transferring knowledge between colleagues while working can be time consuming,

building and managing knowledge communities have become critical for organizations (Saint-

Onge and Wallace, 2003; Wenger, 1998). As recently observed by scholars in the field of

economic geography (e.g., Hall and Jacobs, 2010), a major part of the challenge behind this is

the design and development of proximity (Boschma, 2005). Although it supports the interactions

that are required for learning to occur, spatial proximity does not always stimulate knowledge

transfer. Nevertheless, it may stimulate other dimensions of proximity that are necessary for

effective knowledge transfer.

Proximity can be cognitive, organizational, institutional, social, and geographical

(Boschma, 2005). Some of these dimensions are particularly relevant, since a large part of tacit

knowledge is deeply rooted in action, commitment, and involvement (Cook and Brown, 1999).

For instance, knowledge flows more easily if individuals' relation is socially embedded

(Granovetter, 1985). This social embeddedness is the extent of trust and reciprocity in relationships between individuals and the social cohesion in a relationship (Reagans and McEvily, 2003). That is, the more dense the network in a relationship, the more the individuals in that relationship are willing to invest time and energy to transferring knowledge between one another (Cross and Sproull, 2004). In addition, knowledge transfer also implies a certain degree of cognitive proximity (Nooteboom, 2000; Nooteboom et al., 2007). This proximity dimension refers to a shared knowledge base between individuals and the capacity of these individuals to understand one another, transfer knowledge, and learn from one another (Boschma, 2005). In other words, since effective knowledge transfer requires the ability to absorb, clarify, interpret, and apply new knowledge (Cohen and Levinthal, 1990), individuals' cognitive distance ought not to be too large to learn from one another. These dimensions of proximity deserve more attention (Boschma, 2005).

Such proximity can only be realized within the right context. In that regard, an organization should provide conditions for relationships to emerge, spaces for knowledge transfer and creation that Nonaka and Konno (1998) call Ba. These spaces can be physical, virtual or mental, and encourage the conversion of both explicit and tacit knowledge. Unfortunately, there is still very little empirical work on the development of such a context (Nonaka et al., 2006).

3.2.4   Intergenerational knowledge transfer

While most young workers show a strong desire to learn with the aim of achieving a certain level of professional autonomy (Ebrahimi et al., 2008), most late-career workers want to continue

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working (Cappelli and Novelli, 2010). However, the roles given to these workers are crucial. Indeed, over time, they show less confidence, lose their motivation regarding achieving operational tasks, and can also display a high level of anxiety about their raison d'être within their organization (Ebrahimi et al., 2008). They actually look for ways to be useful, notably by transferring their wealth of knowledge gained through the years to the new generation (Mor-Barak, 1995), but are often under-utilized (Coy, 2005; Ebrahimi et al., 2008).

While a specific element of intergenerational interactions lies in the potential to transmit knowledge that one generation has developed by virtue of its location in a chronological order, the successful transfer of that knowledge across generations cannot be taken for granted (Joshi et al., 2010). Studies show that the intergenerational transfer of knowledge is not systematic enough, or that there is no transfer at all (Kuyken et al., 2009). For instance, the perceptions of generations involved in the transfer of tacit knowledge are not consistent about what deserves to be retained, transferred, and reused by the next generation (Hu, 2005). Furthermore, research has only recently been undertaken to specifically investigate the issue of intergenerational interactions. More studies are hence needed to evaluate interventions which alter organizational work practices to encourage knowledge transfer across generations.

Given the gaps identified in the literature, this research has been guided by an analysis of the strategy for intergenerational knowledge transfer at LPHSSC. Before this research is described, the setting in which the study took place and the methodology used are presented.

3.3   RESEARCH SETTING

Locally renown for the high quality of its services and its leadership in healthcare, LPHSSC is formed of one hospital with 85 beds for short-term care, five local community services centers and service points, four residential or long-term care centers, three intermediate resources (300 residential or long-term places), and one home-care service. It has an operating budget of $80 000 000 and serves 60 000 people per year. LPHSSC relies on close to 1 300 employees, 130 doctors and pharmacists, as well as 500 volunteers. Among its workforce, it can count on 441 nurses. At the time of this study, 27% of them were over 50 years old and only 20% under 29 years old.

Well-aware of the growing labor shortage threatening to affect the quality of care, as well as the risk of a loss of organizational knowledge with a large proportion of its nurses nearing retirement, LPHSSC committed to a strategy for ensuring efficient intergenerational knowledge transfer.

3.3.1 LPHSSC's strategy for intergenerational knowledge transfer

Backed by the Health Care Management and Governance Experimentation Laboratory, whose mission was to encourage innovation in the health sector organizations of the Montérégie Region, LPHSSC deployed a strategy for intergenerational knowledge transfer through the Intergenerational Cooperation Program (ICP), which is depicted in Figure 3.
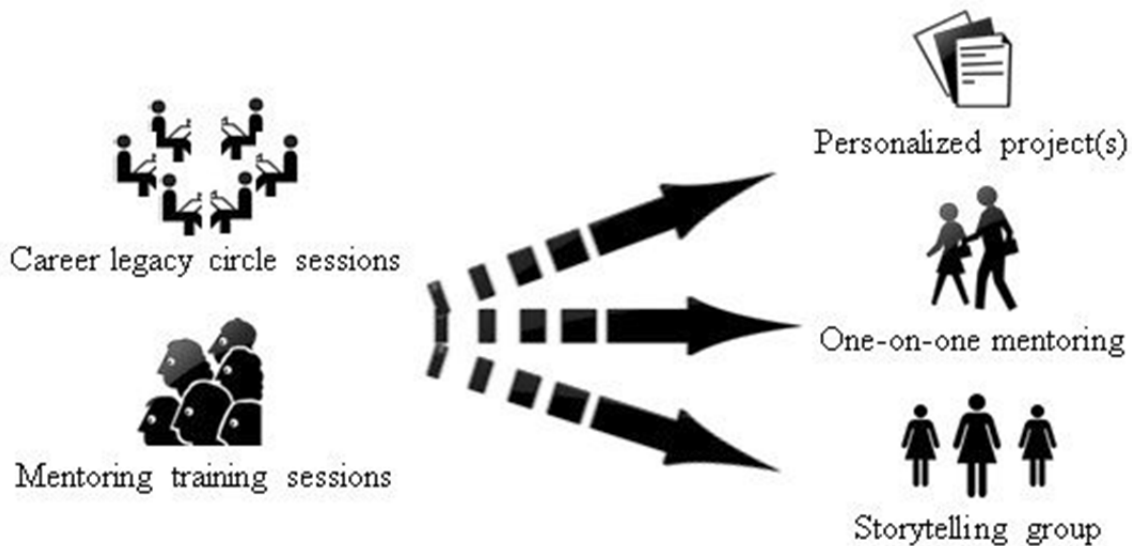
Figure 6– ICP's components

Every year, the organization allowed about ten LCNs from different sectors to benefit from the re-arrangement of their working hours, which freed up one day per week from September to May. During these days, the LCNs had to define their professional legacy in a "career legacy circle" and optimize their mentoring skills through customized training sessions. Emphasis was placed on communication skills, therefore the LCNs were taught to convey information about the job requirements clearly and to give directions effectively without criticizing the Rs. Afterwards, the LCNs had the option to pass on their professional heritage in a personalized project, to mentor Rs, and/or to participate in storytelling group meetings where knowledge from their past experiences could be shared. It is important to note that the Rs' participation in the ICP was voluntary and not recognized as working hours.

The "career legacy circle" sessions allowed the nurses nearing retirement to look back on their professional life, discuss it in the group, and identify their personal most valuable legacy to

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today's young nurses. On the other hand, mentoring training sessions offered the LCNs an

opportunity to discover themselves and the role they could play as an "influencer". They also

learned how to listen without judging matters when acting as a mentor to Rs. Accumulated

knowledge could thus be passed on to the new generation through their preferred method: a

personalized project, one-on-one mentoring and/or storytelling group meetings. On these

occasions, the content of the discussions was confidential and not circumscribed by the

organization.

A year after this strategy for intergenerational knowledge transfer was deployed, nine

LCNs from five different sectors had participated in the ICP. All of them mentored young nurses

through storytelling group meetings and one-on-one mentoring sessions, with the exception of

one who instead realized an ambitious project to transfer her accumulated knowledge – writing a

book on her nursing life. Overall, a total of 15 Rs were mentored, and several storytelling group

meetings were organized.

3.4   RESEARCH METHODOLOGY

An exploratory research approach was adopted to study LPHSSC's strategy for intergenerational

knowledge transfer. The case-study method was chosen to highlight elements that were partially

unknown and deeply rooted in the workplace, as well as to collect and understand the different

stakeholders' perceptions and ideas. The rationale behind this single-case design is that the ICP

is a unique case that is worth documenting and analyzing (Yin, 2009). Requiring involvement at

the empirical level, such an approach gave the author the opportunity to create an intimate

connection with the phenomenon under study (Eisenhardt, 1989). A broad perspective was taken

before focusing on data relevant to the study as this became clearer. There was an important fit between the study objectives and those of the LPHSSC, which is used to partnering research projects, and whose members recognize the added value of such an exercise. The basis for a trust relationship was therefore quickly established. This trust allowed for easier access to key actors and to several other data sources, thus ensuring the validity and relevance of the research methodology (Yin, 2009).

3.4.1 Data collection

A triangulated approach (Denzin, 1989) was employed in respect of the data collection, which included non-participatory observation, focus groups, documentary analysis, and semi-structured interviews. The observational role consisted of standing back to permit systematic observation of group processes and note an evolution within the intergenerational knowledge transfer activities. Field notes were collected and analytical memos were developed as the fieldwork progressed. Five meetings that lasted two to three hours were attended. Moreover, two focus groups were conducted with the LCNs mid-way through the research. Each of them lasted two hours and covered the ICP's progress. Documentary analysis targeted at what happened as a result of the ICP was also undertaken. All data collected was used to deepen the author's understanding of the context under study, to build a relationship of trust with the different stakeholders, and to improve the design of the interviews by ensuring the cultural relevance and appropriateness of the questions, follow-up questions, and probes.

A total of 17 semi-structured interviews were carried out. The sampling was purposeful and determined by redundancy (Patton, 2002). None of those approached for an interview

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refused. Six LCNs and four Rs were interviewed along with four managers, two "observers" (colleagues of the ICP participants), and the program manager. This made the triangulation of the interviewees possible and led to a more valid picture of the knowledge transfer activities. Furthermore, the LCNs and the Rs interviewed showed differences in their participation levels, which allowed maximum variation sampling, eliciting as broad an understanding of the context under study as possible (Patton, 2002). Developed and pre-tested according to Sudman and Bradburn's criteria (1982), the interview guide was divided into four sections: interviewee background, perceptions of the intergenerational knowledge transfer strategy, intergenerational knowledge transfer activities, and their value. Each interviewee was asked to provide instances of how her observations were applied in reality. The interviews were transcribed after each interview was completed. The data collection methods selected, were not only convenient regarding interpretations (Rossman and Rallis, 2003), but also provided the author the opportunity to enter the world of different groups of actors, and helped avoid single-respondent bias.

3.4.2 Data analysis and interpretation

The data analysis was undertaken concurrently with the data collection. A pattern analysis of the rich and detailed data account was undertaken (Patton, 2002). First, familiarization with the data was achieved by transcribing it, reading and re-reading it, and noting initial ideas of the knowledge transferred through the ICP. Secondly, the initial codes were generated for interesting data features. Thereafter, potential patterns were explored by gathering all the data relevant to

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each of these features. After reviewing the features by means of a thematic "map" of the analysis, each theme was defined and named to produce a draft of the findings.

In addition to taking human subjectivity, which is inherent in any researcher, into consideration by making an effort of reflexivity, a strategy of member checking was deployed to maximize the validity of the collected data (Creswell, 2009). The draft of the findings was then presented to a sample of respondents, who commented on the reasonableness of the interpretations. None of the comments needed to be incorporated into the final analysis.

3.5   FINDINGS

To present the findings, the author explores the intergenerational knowledge transfer strategy that was deployed by LPHSSC through three stages. First, the activities before the actual transfer of knowledge took place are examined. Second, the nature of the knowledge transferred between the LCNs and the Rs is described by using two models of knowledge transfer: the source-recipient model and the mutual exchange model. Both groups of participants richly articulated the value of the ICP for knowledge transfer. Case evidence illustrates that both explicit and tacit knowledge were transferred. Third, the value of the knowledge transfer is examined.

3.5.1   Knowledge transfer: ex ante

Throughout the career legacy circle sessions as well as the mentoring training, it appears that the LCNs realized that they had gone through significant experiences in their professional life. In fact, as they experienced the difficult and uncomfortable task of introspective analysis and reflexive questioning, the LCNs developed a unique group synergy. And this group synergy

allowed the LCNs to discover new colleagues and, through their stories, they were able to gain a better understanding of the skills they had acquired to face the complex reality of their respective department. According to one of them: "The ICP helped me realize the full extent of the knowledge I have gained over time and how useful it can be for my colleagues." (LCN)

Gaining such awareness of the critical knowledge they possessed encouraged the LCNs in helping the Rs by transferring advice, specific techniques, ideas or meaningful stories from their practice and personal history. One of the manager interviewed explained: "Looking at themselves allowed them to gain the confidence necessary to help others." (Manager) In fact, the LCNs claimed to have a better understanding of the reality of newcomers and the influence they can have on them. They felt compelled to design a workplace in which recruits would receive positive reinforcement from their more experienced counterparts. In other words, the LCNs were now willing to make it easier for the Rs to learn about the day-to-day aspects of their new position. As one of them mentioned: "I need not to judge, sermonize or moralize younger nurses. I am interested in exchanging with them about what I do and what I have been doing for the past 30 years." (LCN)

3.5.2 Transfer of knowledge

According to the interviewed ICP participants, one-on-one mentoring took place in neutral places (i.e. a restaurant, coffee shop, etc.) every two or three weeks for one or two hours. These meetings were mainly used to discuss current issues broached by the Rs in relation to the LCNs' experience. Some of them also exchanged knowledge through emails. The following knowledge objects were covered: how to deal with the family of a patient, how to approach and manage a

difficult patient, how to interact with colleagues (physicians, nurses, etc.), etc. A young nurse explained: "These are not things that are written in books… it is practical knowledge and skills while in books we get easy examples in which reality is well defined. But it never happens like this in real life; it is never that simple!" (R)

The Rs prepared for the meetings by noting their good and bad shots of the last few weeks, which then served as discussion items. On occasion, advice from the LCNs also touched on the private life of the Rs (e.g., family-work balance). In addition, many discussions were about the inner workings of the organization. According to the interviewed participants, all hospitals differ and the LCNs served as guides to the Rs. The knowledge that was transferred at these times ranged from the usual routine within a given department to phone numbers of contact persons to resolve administrative issues, such as knowing of or applying for openings in another department, pay slip problems, etc. According to the informants, those exchanges allowed for a better understanding of the different departments of the organization and, thereby, of the opportunities to explore other facets of the job.

One-on-one mentoring sessions and the storytelling group meetings allowed the participants to share about the ups and downs of their job in some detail. In the words of an LCN:

"In all truth, although it is demanding, what is exhausting in nursing is not so much the physical aspect of the job but rather the emotional one. It is difficult to continually rub shoulders with disease and death. We need to vent our emotions at times but we can't do so while working. In that sense, the ICP activities were a wonderful platform." (LCN)

In addition, the LCNs particularly supported the Rs with regard to their personal development within the nursing profession (e.g., sharing how each of them reacted to their first death). Rs enjoyed the liberty of raising issues which they felt were relevant to their actual needs.

More knowledge was transferred from the LCNs to Rs through personalized projects. A number of documents were produced (e.g., a book of stories was written on how to deal with patients in a terminal stage, and checklists for different procedures were created or updated) and distributed throughout the organization. According to the managers interviewed, some of these documents helped capture and describe the organization's processes, hence giving clear guidelines about its current policies, procedures and protocols. However, the Rs did not consider such material to be as beneficial as the one-on-one mentoring sessions or the storytelling group meetings. According to them, while the documents in question were an efficient way of providing help, most of the learning occurred during one-on-one mentoring sessions and the storytelling group meetings.

As depicted in figure 4, the ICP allowed the establishment of two intergenerational knowledge transfer models: one associated with a source-recipient model and the other with the mutual exchange model. The former is illustrated by the personalized projects during which the LCNs personally decided what knowledge should be transferred to the Rs and created artifacts that pertained to that knowledge.
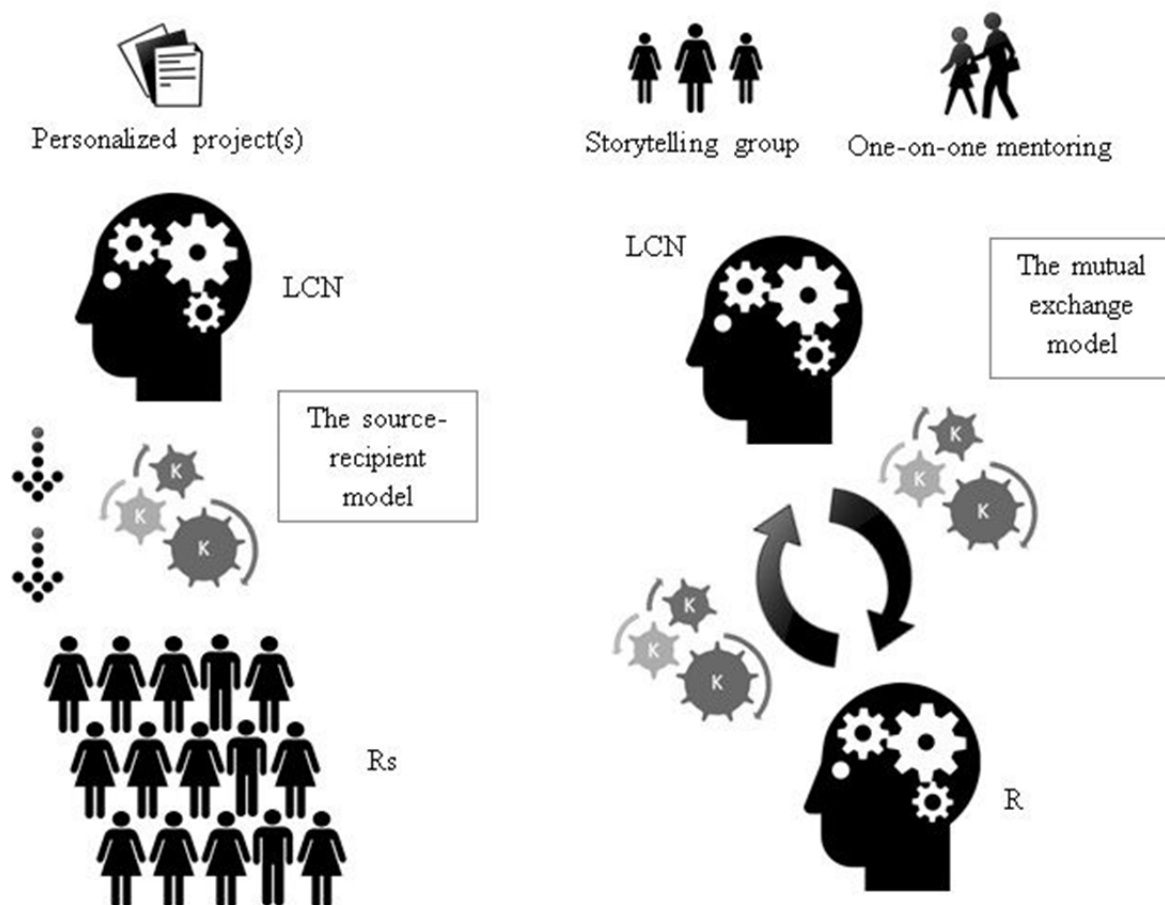
Figure 7 – Two intergenerational knowledge transfer processes in the ICP

On the other hand, one-on-one mentoring sessions and storytelling group meetings generated a back and forth movement of knowledge between the nurses. For instance, the Rs brought knowledge from their practice to the LCNs, who used that knowledge as a starting point or a common basis to transfer their own accumulated knowledge. The Rs could then apply that knowledge to matters crucial for their job and return to those intergenerational knowledge transfer activities with new knowledge to exchange. Every time the Rs and the LCNs interacted,

debate and dialogue were encouraged, which contributed to the understanding between them and of their cognitive paradigms.

3.5.3 Knowledge transfer: ex post

The intergenerational knowledge transfer strategy deployed by LPHSSC was very valuable for the ICP's participants. The Rs stated that they had managed to overcome several fears due to the ICP. They became less afraid of making mistakes and began to provide more potential solutions when facing difficulties. They appeared to be less worried about looking silly and showed less hesitation about asking for clarification and advice. This experience allowed the Rs to deepen their understanding of the importance of nurses' role in the continuum of care. According to the interviewees, this was reflected in their degree of participation within their team. Daily initiatives, the development of new tools, and some of them taking on new positions are examples that support the interviewees' views. One of the managers interviewed concluded that the Rs were solving more problems themselves. This led to an improvement in the nurses' performance, with two of the four managers interviewed indicating that changes were evident.

Also, the LCNs emphasized that the ICP created a special link between the participants. By establishing such relationships, they became friends. Managers also noticed that all the nurses under their supervision showed a greater willingness to collaborate. They stressed that the nurses had become closer to one another. One of them explained: "Some nurses were sometimes ignored or left alone. Now, it looks as if they have realized they share the same problems and they have somehow created a common identity." (Manager)

3.6 DISCUSSION

The diagnosis prompting the LPHSSC to deploy a strategy for intergenerational knowledge transfer centered on the growing nursing shortage. The following section discusses how this strategy served its mission of transferring knowledge between the LCNs and the Rs.

3.6.1 Knowledge transfer as making learning possible

With respect to its goal of intergenerational knowledge transfer, the ICP led to the conversion of both explicit and tacit knowledge. The mobilization and conversion of the different dimensions of knowledge can actually be indicated as prescribed by Nonaka and Takeuchi (1995). The source-recipient model can be associated with the process of externalization, during which tacit knowledge is converted into explicit knowledge and translated into readily understandable forms. On the other hand, the model of mutual exchange can be associated with socialization, with shared experiences stimulating the acquisition of skills and the establishment of a common frame of references.

The one-on-one mentoring and the storytelling group meetings served as a rare instance of the development of a Ba (Nonaka et al., 2006). Both of these activities went beyond the mere codification of explicit knowledge as suggested by the "knowledge as an asset" perspective (Empson, 2001) and the source-recipient model. The activities surpassed mere dissemination of knowledge through standardized formats and informational messages that are both recognizable and easily reusable. This research shows that both explicit and tacit knowledge were transferred through the mutual exchange model. This model supported the transfer of knowledge from one individual to the collective level through a back and forth movement, which appeared to have a greater impact on its stakeholders.

By contributing with inquiries derived from their practice, the Rs were well served by the mutual exchange model. Furthermore, the way they processed the verbal material depended on the structures that not only enabled them to process bigger chunks of subject matter, but also gave them tacit knowledge of the methods, procedures, and conventions used in the field of nursing and in their organization. Whether intentionally or not, through their interactions with the LCNs, the Rs were learning how to become more skilled in understanding what is important and what is not. This approach helped the Rs to create new references by exploring the cognitive structures already in their minds. The ICP also made knowledge relevant by selectively drawing on past experience and bringing it forward to address the situations at hand (Tsoukas, 2009). Learning became individually adjusted as the LCNs became familiar with each nurse's zone of proximal development (Løwendahl et al., 2001). By analogy, the LCNs found themselves creating bonds between knowledge previously acquired by the Rs and learning occurring in the field.

This intergenerational knowledge transfer strategy was very well designed since classic studies over the past five decades have repeatedly shown that, in discussion, learners pay attention and think more actively (Svinicki and McKeachie, 2006). Indeed, one of the better methods for producing focus is to use a problem as the main topic of discussion, which is exactly what the Rs had in mind when they met with the LCNs. Thus, the Rs were not passively listening to LCNs' advices, but were instead co-developing relevant knowledge through their mutual exchanges. In addition, the LCNs' task was not to sell a particular solution to the Rs, but rather to listen and teach them how to solve problems themselves. By providing the Rs with some autonomy while ensuring the pace in an environment focused on learning, the mutual exchange

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model is a good example of "knowledge transfer as making learning possible" (inspired by Ramsden (2003)).

3.6.2   The role of proximity in the mutual exchange model

Throughout the ICP, both time and space were tightened to allow knowledge to be transferred through the nurses' direct interactions as represented in the mutual exchange model. The results also show that the ICP has influenced another type of proximity: social proximity was increased. In this sense, the ties that were established and reinforced through the ICP expanded the participants' social circle. Working together within the ICP's boundaries allowed the LCNs to increase their social capital, which is both the social network itself and the benefits that can be realized through social relationships (Nahapiet and Ghoshal, 1998). As illustrated by other scholars (e.g., Cropanzano and Mitchell, 2005), the repetition of successful exchanges strengthened and deepened the participants' respective relationships. Consequently, in accordance with Coleman's writings (1994), the network closure that the ICP engendered, encouraged the development of common goals, norms, and reciprocal expectations about their peers' trustworthiness, which enhanced the quality of the knowledge that they transferred to one another.

The findings support Willem and Scarbrough's results showing that social capital does not operate in a purely instrumental way, which could limit knowledge flows (2006). A number of the ICP activities took place through informal face-to-face interaction, which ensured the creation of social rather than purely work-related relationships. Indeed, despite weak ties at the beginning of the ICP, the participants progressively became emotionally attached to one another,

hence building stronger connections and enhancing the potential for knowledge transfer. This study therefore provides another example that growth in social capital is beneficial in terms of intellectual capital, as well as cooperative behavior. In other words, the ICP reinforced what Lee (2008) calls a "bonding network", which is encouraging moral obligations, intimate knowledge transfer, and a sense of belonging. The participants' strong sense of belonging to the ICP had a major effect on the density of the knowledge transfer relationships. Knowledge transfer appeared to be wed to interpersonal and intergenerational relations.

3.6.3 Intergenerational knowledge transfer enablers

Based on the above-mentioned results, it can be inferred that the ICP (especially the career legacy circle sessions) provided the LCNs with the possibility to get to know themselves better and gain awareness of their accumulated knowledge, after having taken stock of their lives. By offering them an opportunity to reflect on their practice, choose what they perceive as their most valuable legacy, and transfer this to the Rs, the ICP allowed them to take the full measure of their personal work qualities, qualities that derive from their status, their role, and their commitment. Previously considered trivial, these qualities became important objects of their identity and were then perceived and defined as significant. The LCNs received recognition from their peers and their organization through the validation of their accumulated knowledge as treasured and worth transferring. Such support was particularly important and can be linked to other studies that have demonstrated that knowledge transfer appears to be contingent on individuals' confidence in sharing valuable knowledge (e.g., Cabrera et al., 2006; Siemsen et al., 2007).

The LCNs were empowered through an interpersonal process whereby the correct information, support, resources, and environment were put in place, enabling them to formulate their increased personal ability and effectiveness and thus set and achieve their own intergenerational knowledge transfer goals. As illustrated by the theories of Kanter (1993), this empowerment gave the LCNs the capacity to influence the behavior of other nurses. They were able to improve the level of collaboration and knowledge transfer, as they reinforced their shared identity, which is tied to what they know (von Krogh et al., 2011).

3.7   IMPLICATIONS FOR RESEARCHERSAND PRACTITIONERS

The findings of this study have implications for the design of intergenerational knowledge transfer strategies. This study shows that the innovative and facilitative, rather than bureaucratic and instrumental, design encouraged the nurses to adopt the ICP approach to intergenerational knowledge transfer. Those responsible for the ICP were interested in cultivating a sense of belonging among the participants within a collective environment, rather than trying to standardize the methods and results related to knowledge transfer. They were also careful not to stifle the LCNs' inventiveness. The LPHSSC's intergenerational knowledge transfer strategy is a genuine example of where the participants' preferences were the essence of the intergenerational knowledge transfer activities. This focus assured that the knowledge transfer mechanisms would not become a burden to the participants. Such extensive autonomy and empowerment are necessary conditions for intergenerational knowledge transfer. In other words, it would be inappropriate to regard the consolidation and validation of knowledge through rigorous top-down procedures as the only intergenerational knowledge transfer approach, especially since the

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accumulation of explicit knowledge may prove useless if the learners do not understand its

contextual use. As Biggs asserted, "knowing facts and how to carry out operations may well be

part of the means for understanding and interpreting the world, but the quantitative conception

stops at the facts and skills. A quantitative change in knowledge does not in itself change

understanding." (1989: 10)

Rather than dealing with factual questions, the study shows that it is beneficial to

formulate discussions in order to examine the relationships, applications, or analyses of facts and

materials. In this respect, the ICP avoids the prospect of only learning through formal lessons

(e.g., the source-recipient model) – as if it were possible to put the wisdom of employees nearing

retirement into a box, ready to be consumed by new entrants. Instead, the ICP approximates that

of learning by interacting (Lundvall and Borras, 1998) to reckon the potential learning that

brings a network of employees from different generations interacting with one another. This is

consistent with Yang (2007, as cited in von Krogh et al.), who shows that "styles involving strict

policies and procedures will be less supportive of knowledge [transfer] than styles emphasizing

human interaction, affiliation, morale, cohesion, and workplace harmony." (2011: 5)

Finally, Davenport and Prusak state that "the best way to transfer knowledge is to hire

smart people and let them talk to one another." (2000: 88) However, it is not always that simple.

For instance, hospitals' working environment is definitely less suited to Davenport and Prusak's

approach to knowledge transfer. First, rigid and bureaucratic, a hospital's everyday functioning

tends to inhibit the emergence of knowledge transfer initiatives, especially the transfer of tacit

knowledge. Second, nurses' work is a challenge in itself: "The physical demands of 12-hour

shifts are difficult for older nurses. They spend long hours on their feet and stress joints that have been subject to years of wear and tear. The complex care needs of patients, combined with the nursing shortage, may stretch the capabilities of even the most physically fit nurses." (Bell, 2006: 56) The burden thus generated for nurses has a negative influence on the transfer of tacit knowledge. This study offers an answer to the need for job redesign to address the issues of heavy workloads and stress for older employees, while creating reflexive social interactions and knowledge transfer opportunities with their younger counterparts. Called "unreflective practice" (Tsoukas, 2009), employees facing daily activities similar to those of nurses need their organizations to decisively create such interactions and opportunities. Managers play a central role to this end by building bridges between individuals (occasions of socialization). Therefore, employees stuck in such an "unreflective practice" should not be working in a vacuum, isolated from their peers. Researchers and practitioners need to find ways to provide common ground for collaboration by managing proximities between workers of different generations.

3.8   LIMITATIONS OF RESEARCH / SUGGESTED FUTURE RESEARCH

Given the availability of funding and time available, the research was designed to be exploratory. Therefore, the results can't be generalized and the ICP should not be applied mechanically with the expectation of automatic outcomes. In other words, the findings should not be taken as either exhaustive or conclusive. The purpose of this research was to provide rich data on the ICP participants' views and experiences and to alert academics and practitioners to the existence of an innovative, intergenerational knowledge transfer strategy.

In addition, as is often the case in knowledge management research, this study utilized self-reported transfer of knowledge, which may have resulted in some level of socially desirable responding. The participants may therefore have been motivated to portray the ICP in the most positive light possible. For this study was conducted over a short period of time, direct access to individual and/or group performance data might have been beneficial. In this sense, it would be interesting to extend the evaluation of such strategies over a longer period of time in order to better judge of its long term value. However, there remains a strong need to develop rigorous tools that could measure the individual and organizational benefits associated with a particular knowledge transfer strategy. Indeed, while activating these learning mechanisms builds up capacity and capability to innovate, the context of resource scarcity in which health sector organizations operate requires some sort of costs-benefits analysis. Though, these organizations must remain conscious that the benefits in question extend well beyond the balance sheet and to the intangible world.

It would also be interesting to spread the ICP to other occupational groups. Having members of different trades going through the first phase of the ICP together could very well influence the nature of the relationship between constituent organizational parts. Since the extent to which boundaries between different occupational groups are overcomed have been shown to foster innovation in health sector organizations (e.g., Habersam and Piper, 2003; van Beveren, 2003; Rye and Kimberly, 2007; Wyatt, 2001), this might serve as an opportunity to break occupational and/or structural isolation. A challenge for both research and practice, the establishment of social capital between members of various occupational groups could promote

shared understanding and build the high levels of trust required for knowledge transfer and creation to occur.

Investigating how technological tools such as mobile computing could be added to an ICP-like strategy in order to establish a broader approach to knowledge exchange across multiple generations in multiple directions also represents another avenue for future research. In addition to social capital, building structural capital might help further optimize the flows of knowledge within the organization, and this, at a relatively low cost. On the flip side, it might also disenfranchise the types of tacit knowledge exchanges outlined in this paper. More research is definitely needed here.

Finally, this study highlights the need for motivation, inspiration, and empowerment in knowledge transfer and creation. Often ignored or underestimated (von Krogh et al., 2011), the importance of these variables calls for more examination.

3.9   CONCLUSION

Faced with a growing labor shortage threatening to affect the quality of care, as well as the risk of a loss of organizational knowledge with a large proportion of its nurses nearing retirement, LPHSSC deployed a strategy for transferring knowledge from LCNs to Rs. Considering that more than four out of every five Canadian organizations have yet to plan how to transfer tacit knowledge between generations (Conference Board of Canada, 2008) and that general knowledge management programs often work only for a minority of the employees involved in them (Løwendahl et al., 2001: 919), such an example could help other organizations address this very issue. As the workforce ages, organizations that can encourage intergenerational knowledge

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transfer will be best suited to continue to operate successfully in an increasingly challenging labor marketplace.

In order to maintain the current and future well-being of organizations, the value of older workers should not be underestimated. As prescribed by Nonaka et al. (2006), to transfer and create knowledge, an organization has to bring the right mix of people to the right context and promote their interaction. This study shows how these mechanisms can be designed. By creating meaningful connections between generations, strategies like the ICP give organizations an opportunity to recognize and confirm their members' skills and experience, to instill a desire to pass on knowledge, and have the power to optimize the working environment.

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CONCLUSION

Ma thèse avait pour objectif de contribuer à comprendre les enjeux managériaux associés au partage et à la création de connaissances en organisation, et ce, en tirant profit de l'approche basée sur le concept de communauté. Je mobilise à la fois les perspectives cognitives (ex., Hansen 1999; Hedlund 1994; Nonaka 1994; Nonaka and Takeuchi 1995) que sociomatérielles (ex., Brown and Duguid 1991, 1998, 2001; Chanal, 2000; Cook and Brown 1999; Gherardi et al. 1998; Orr 1996; Wenger 1998) de la connaissance et tente de lier un concept de la théorie des organisations (communauté) au champ du management stratégique (capacités dynamiques).

Le **premier** article a positionné le concept de communauté au niveau stratégique de l'organisation en introduisant celui-ci dans la théorie des capacités dynamiques. J'ai alors insisté sur le besoin d'élargir notre compréhension des microfondations des capacités dynamiques au-delà des habiletés cognitives et du talent entrepreneurial des hauts dirigeants, en présentant une représentation théorique des activités des communautés de connaissances à travers les trois processus de « sensing », « seizing » et « transforming ». Le **second** article fait la démonstration empiriquement de certaines des avancées conceptuelles réalisées dans le cadre du premier article en analysant les activités des communautés de connaissances dans une grande organisation créative, qui évolue dans le secteur du jeu vidéo. Cet article s'intéressant à la génération et au développement des idées – essentiellement les processus de « sensing » et de « seizing » de la théorie des capacités dynamiques – met en exergue le dilemme managérial entre autonomie et contrôle qui se trouve au cœur de la coordination des activités de création de connaissances en mode communautaire.

Les **troisième** et **quatrième** articles s'intéressent pour leur part à la création et au développement d'une communauté à l'intérieur de bureaucraties professionnelles. Le premier, LU, fait état d'un échec alors que le second, LPHSSC, présente un franc succès. Il est intéressant ici de noter que, contrairement à LU, les acteurs impliqués dans le cas LPHSSC ont eu l'opportunité de réfléchir à leur vie professionnelle, d'en discuter en groupe et d'identifier eux-mêmes les connaissances essentielles associées à leur pratique avant de prendre part à quelconques activités de partage de connaissances. De l'autre côté, LU a choisi le thème de la communauté ainsi que les sous-thèmes qui ont été discutés lors des rencontres de ses membres. Des tensions sont vite apparues et, alors que le cas LPHSSC nous démontre un élan d'enthousiasme au niveau des acteurs impliqués, les acteurs au cœur de l'initiative chez LU ont démontré un malaise par rapport à leur participation dans la communauté, à tel point qu'ils évitaient de prendre part aux rencontres organisées par la direction ou que leur participation lors des rencontres était minimale. Bref, le plus grand niveau d'autonomie et de liberté dont ont joui les acteurs de LPHSSC semble avoir eu un grand impact sur la réussite du projet de création et de développement d'une communauté de connaissances. Cela soutient le point de vue d'auteurs qui mettent de l'avant l'aspect organique et émergent du phénomène communautaire (Brown and Duguid 1991; Cox 2005; Duguid 2008; Gherardi and Nicolini 2000; Lave and Wenger 1991; Orr 1996; Raz 2007) à contrario de ceux qui y voit un outil d'apprentissage organisationnel qui n'attend qu'à utilisé activé par la hiérarchie (ex., Kimble and Bourdon 2008; McDermott 2000; Saint-Onge and Wallace 2003; Wenger 2004; Wenger and Snyder 2000; Wenger et al. 2002).

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