THÈSE POUR OBTENIR LE GRADE DE DOCTEUR DE L'UNIVERSITÉ DE MONTPELLIER

En Sciences de Gestion

École doctorale Économie et Gestion

Unité de recherche Montpellier Recherche en Management

IT CONFLICT CONTAGION: ACTION RESEARCH IN A CONSULTING CORPORATION

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Le 22 novembre 2017

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Abstract

User conflicts and resistance behaviours represent one of the major managerial difficulties during Information Systems (IS) implementation. Although numerous IS studies tackle user resistance and conflicts by anticipating, minimising or even amplifying these negative behaviours, little research has taken into consideration the contagion mechanisms of conflicts and examined why and how users similarly resist to entirely different Information Technology (IT) projects. The IS literature is sparse on addressing the impact of resistance behaviours that occurred in the past on the new IT. IS managers need to anticipate potential causes for project failure because of ongoing resistance behaviours toward the new IT, but also because of resistance behaviours occurred in the past and persist until today, or are likely to reappear. For IS researchers and practitioners, my research gives greater attention to issues related to current and prior conflicts occurring in a firm's IT project portfolio. Therefore, we particularly mobilise the theories of contagion and Inoculation which have been so far weakly used in the field of information systems. The empirical part consists of a three-year action research project conducted at Efficient Innovation Corporation (a French management consulting firm). Firstly, my observations reveal that employees expressing task-oriented conflicts towards an IT deployment project were likely to use a bypassing strategy, hiding socio-political conflicts. Secondly, we were able to identify a phenomenon of conflict contagion between two IT projects despite their strong differences in terms of objectives, functional perimeters and users. Thirdly, the "Inoculation" techniques that we implemented succeeded to stall and limit the diffusion of resistance behaviours toward IT. The underlying message of this thesis is to consider prior resistance behaviours and conflict contagion as key processes integrated into IT implementation. Accordingly, we introduce the concept of "Resistance Path Dependency", and propose a conceptual model of possible conflict contagion mechanisms between different teams and IT projects.

Keywords: IT implementation, Resistance, Conflicts, IT conflict contagion, Inoculation, Resistance Path Dependency, Action Research

Résumé

Les conflits et les comportements de résistance des utilisateurs représentent une des difficultés managériales majeures lors de l'implémentation des Systèmes d'Information (SI). Bien que de nombreuses études de SI abordent la résistance et les conflits des utilisateurs en anticipant, en minimisant, ou même en amplifiant ces comportements négatifs, peu de recherches ont pris en compte les mécanismes de contagion des conflits et ont examiné pourquoi et comment les utilisateurs résistent de manière comparable à des projets de Technologie de l'Information (TI) entièrement différents. La littérature en SI semble être limitée quant à l'impact des comportements de résistance survenus dans le passé sur le nouveau projet TI. Or, les gestionnaires doivent être en mesure d'anticiper les causes potentielles de l'échec du projet en raison des comportements de résistance en cours, mais aussi à cause des résistances apparues dans le passé et qui perdurent ou sont susceptibles de réapparaître. Pour les chercheurs et praticiens en SI, cette recherche met en lumière les liens entre des problèmes liés aux conflits actuels et antérieurs survenus dans le portefeuille de projets TI d'une entreprise. Pour cela, nous mobilisons, en particulier, les théories de la contagion et de l'inoculation qui n'ont été à ce jour que faiblement utilisées dans le domaine des systèmes d'information. La partie empirique consiste en un projet de recherche-action de trois ans réalisé chez Efficient Innovation Corporation (une société française de conseil en management de l'innovation). Tout d'abord, mes observations révèlent que les employés qui expriment des conflits axés sur les tâches vers un projet de déploiement TI sont susceptibles d'utiliser une stratégie de contournement dissimulant des conflits sociopolitiques. Deuxièmement, nous avons pu identifier un phénomène de contagion de conflits entre deux projets TI malgré leurs fortes différences en termes d'objectifs, de périmètres fonctionnels et d'utilisateurs. Troisièmement, les techniques « d'inoculation » que nous avons pu mettre en œuvre ont permis d'enrailler voire de limiter la diffusion de comportements de résistance envers les TI. Le message sous-jacent de cette thèse est de considérer les comportements de résistance antérieurs et la contagion des conflits comme des processus clés intégrés à l'implémentation des TI. A cet effet, nous introduisons le concept de "Resistance Path Dependency", puis nous proposons un modèle conceptuel du mécanisme de contagion possible des conflits entre différentes équipes et projets TI.

Mots clés : Implémentation des TI, Résistance, Conflits, Contagion des Conflits TI, Inoculation, Resistance Path Dependency, Recherche-action

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ACKNOWLEDGMENT

Without the support of many people, this work would not have been possible. It is my honour to extend my thanks to my dear friends, colleagues, and family in my opening remarks. However, I am very much aware that these words cannot fully express my vast gratitude.

First of all, I would like to express my sincere gratitude to my supervisor Professor Régis Meissonier for the continuous support, for his patience, creativity, motivation, enthusiasm, and immense knowledge. His guidance helped me in all the time of research and writing of this thesis. I could not have imagined having a better advisor and mentor.

Moreover, I would like to thank my thesis committee: Professor Liette Lapointe, Professor Frantz Rowe, and Professor Serge Amabilé, for giving me the honour to receive insightful and precious comments from the elite of the IS research community.

My warmest thanks also go to Dr. Jean-Louis Aune, Eric Briole, Stefan Brouwers, Julien Mouysset, Yvan Demailly, and Fulcran Fezard, for offering me the ideal working environment and leading me on diverse, exciting projects at Efficient Innovation Corporation.

Likewise, I thank all my colleagues at Efficient for the stimulating discussions, for the hard moments we were working together before deadlines, and for all the fun we have had in the last four years.

Exceptional thanks also belong to my family. Without the continuous support and love from my parents, my brothers Shady, Fady, Mario, my sister Marina, I would not have been able to write this thesis and to carve my life in the way I did. I am very thankful for all the opportunities my family made possible to me.

Finally, I want to honour the love and loyalty of an extraordinary person in my life, my wife Marie, who supports me in an exceptional way.

Paris, September 2017
Peter Bou Saba

INTRODUCTION

Edward Lorenz[1] included in a lecture he gave on December 1972 at a session of the annual meeting of the AAAS (American Association for the advancement of Science): *"a butterfly flapping its wings in Brazil can produce a tornado in Texas?"* Lorenz used the term "butterfly effect" suggesting that the flap of a butterfly's wings might ultimately cause a tornado[2]. The butterfly effect, also known as *"sensitive dependence on initial conditions,"* has a profound corollary: a tiny act done in the past may "contaminate" today's strategy without being able to change the trajectory taken.

On the other hand, the notion of how something becomes "popular" is very relevant to the concept of contagion. Rumours, behaviours, emotions, and opinions can spread between individuals like wildfire, "infecting" individuals until they become the norm.

For example, the political transition project in Myanmar[3] has seen a spate of outbreaks of intercommunal conflict, especially among two religious groups. Rumours[4], hate speech and manipulated information have played a role in triggering the conflict. People were more susceptible to manipulated information spread as rumours, with the intent of causing conflict, putting in jeopardy the political transition project.

Novac et al.'s (2014) study on contagion in a psychiatric department, covered some instances in which rumours developed in the hospital. In every case, rumours threatened the cohesion and trust of the treatment team. Rumours, whether started with malice or as a benign comment, reached alarming proportions, undermined the confidence of the employees, and caused conflicts between the individuals of the treatment team. Consequently, conflicts included disagreements over treatment modalities, level of staffing, and questions over staff conduct and behaviour.

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[1] Edward Lorenz: The Guardian: https://www.theguardian.com/world/2008/jun/27/weather

[2] When the Butterfly Effect Took Flight: MIT Technology Review: https://www.technologyreview.com/s/422809/when-the-butterfly-effect-took-flight/

[3] Search for Common Ground: https://www.sfcg.org/wp-content/uploads/2016/09/Myanmar-Community-Information-Management-Report.-SFCG.-March-2016.pdf

[4] Reuters (August 10, 2017): *"Rumour and misinformation will continue to be used to fuel anti-UN and INGO sentiment and hostility and elevate anxieties":* https://www.reuters.com/article/us-myanmar-rohingya-un/u-n-warns-aid-workers-of-rising-buddhist-hostility-in-western-myanmar-idUSKBN1AQ16P

In 2007, a student campaign to embarrass one of Britain's largest banks, HSBC, into reversing its plans to stop interest-free accounts for graduates received much attention[5]. The campaign, called *"Stop the Great HSBC Graduate Rip-Off"*, began on Facebook, after the bank declared it would no longer be offering interest-free overdrafts to new graduates. In just two days, the number of members had doubled. Moreover, student customers worked on encouraging new students to look carefully at their banking options, calling them for a boycott of the bank, and therefore recruiting them along "conflict lines".

For centuries, researchers and theorists in the social and behavioural sciences had a keen interest in rumours and contagion. What was originally a minority belief can become a dominant one as more and more employees are exposed to said belief from their friends and choose to adopt it. It is commonly known that rumours have affected organisational settings. According to Novac et al. (2014), *rumours are pieces of information, instrumentally relevant and unverified, that circulate among people"*. Knapp (1944) defines rumours as shared attitudes, concerns, and anxieties, which create mistrust among the organisation's shareholders.

On the other hand, existing literature in Information Technology (IT) implementation provides rich knowledge to tackle IT project failures, but little knowledge on the effect of contagion on the success or failure of new IT initiatives. One of the most important factors of failures is users' resistance, as well as internal day-to-day conflicts, taking technical, human, social or political dimensions (Klaus and Blanton, 2010; Meissonier and Houzé, 2010; Markus, 1983). Organisational IT tools can upset the intended users, lead to an important burden on employees, and can be catalysts for user resistance (Klaus and Blanton, 2010). Venkatesh and Davis (2000) claim that user resistance is considered as the opposite of acceptance. Conversely, other authors such as Van Offenbeek et al. (2013) observed how users could similarly accept and resist to IT. Lapointe and Beaudry (2014) state that *"acceptance and resistance are mind-sets comprising three dimensions: emotions, cognition, and attitudes, and that the related behaviours are manifestations of these mind-sets."* Few scholars consider conflicts as a behavioural form to express resistance (Ajzen and Fishbein, 1980). Moreover, some researchers provided a framework to anticipate conflicts before IT deployment by maximising resistance instead of reducing it (Meissonier and Houzé, 2010).

[5] Facebook campaign stops 'the great HSBC graduate rip-off'. Daily Mail (August 30, 2007). http://www.dailymail.co.uk/news/article-478842/Facebook-campaign-stops-great-HSBC-graduate-rip-off.html

Moreover, many research studies have been made in the past four decades to assist firms in making better decisions in Research and Development (R&D) project selection (Cluzel et al., 2016; Lawson et al., 2006; Kumar, 2004; Henriksen and Traynor, 1999; Martino, 1995). The literature on R&D portfolio management classifies decision models and methods into the following categories: decision analysis, mathematical programming, interactive methods, economic models, artificial intelligence, scoring, and portfolio optimisation. To enhance the usability of these approaches, a few Information Systems (IS) design research studies were done on using computer-aided Decision Support Systems (DSS) to support the R&D project selection tasks (e.g., Cluzel et al., 2016; Tian et al., 2005; Klapka and Piňos, 2002).

While the majority of these studies focus on developing decision models and designing R&D decision support systems, very little research has been made on R&D DSS implementation from an IT adoption point of view (i.e., user acceptance or user resistance). The need for organisations to adopt such systems come from their anticipated benefits for decision makers. If the intended users are not willing to accept the IS, it will not provide benefits to the firm (Davis and Venkatesh, 1996). Moreover, if individuals have positive expectancies, they would be more likely to encourage acceptance (Norzaidi et al., 2008). On the contrary, if individuals have negative expectancies, they would be more likely to resist to the new IT. At the individual level, resistance is often psychological, requiring a unique and personalised strategy from implementers to minimise the resistance (Markus, 1983). Resistance may also come from the necessary skills that an individual must acquire to adapt to the changes caused by the new IT (Besson and Rowe, 2001; Jiang et al., 2000; Markus, 1983). Tzeng (2011) argues that users' acceptance or resistance depend on the intended users' practical experience and interaction with the new system. In other words, experience-based perceptions give clear clues for individuals to decide whether to use the new system or not (Venkatesh and Davis, 1996, 2000). Additionally, IT systems can distribute more power to the main individuals by allowing them to access real time data (Davenport, 1998). On the other hand, IT can increase user resistance because of the reduced autonomy of employees (Lapointe and Rivard, 2007, 2005), which may lead to the negative feeling of loss of power. Individuals may use technology while also resisting its consequences (Van Offenbeek et al., 2013). That said, while understanding how persons or groups may develop resistance behaviours and resistance to change, one also must take into account resistance contagion that occurs between individuals (Jehn et al., 2013).

Benbasat and Barki (2007, p. 216) stated in a special issue of the Journal of the Association for Information Systems that research on technology acceptance has reached a

point where *"TAM has fulfilled its original purpose and that it is time for researchers to move outside its limited confines."* For instance, although TAM is a rigorous acceptance model with numerous empirical validations, its lack of social factor on behaviour has been the source of criticism (Venkatesh and Davis, 2000; Venkatesh and Morris, 2000; Taylor and Todd, 1995b; Hartwick and Barki, 1994). Then, several extensions of TAM were introduced taking into account factors of social influence, such as, the TAM2 which included determinants of perceived usefulness in social influence processes and cognitive instrumental processes (Venkatesh and Davis, 2000). Following the TAM and TAM2, a variety of acceptance theories has emerged that were eventually united in the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). Contrary to TAM-based prior research studies, many articles in social psychology (Abrams, et al., 1990, Deutsch and Gerard, 1955, Festinger, 1954) and consumer behavioural (Venkatesh and Davis, 2000; Oliver and Bearden, 1985; Shimp and Kavas, 1984) indicate that the influence of other individuals plays a substantial role in explaining human behaviour. Furthermore, normative social influence is an additional factor that was later added to numerous technology acceptance models, based on Fishbein and Ajzen's (1975) assumption, that social influences make individuals conform to the positive expectations of other persons. That said, the IS literature on user acceptance (e.g. TAM, UTAUT, etc.) and user resistance (e.g. AMRIT[6], EIM[7], etc.) provides limited contributions concerning the mechanisms of conflict contagion between individuals. For instance, Dasborough et al. (2015) argued in their study that employees who were feeling negative about the merger of their firm heightened the negative emotions of other similar employees after discussing their concerns with them. Moreover, the anticipation state of change has long been associated with rumours, scattered information and observations. Other authors found that individuals reporting negative rumours experienced greater change-related stress (DiFonzo and Bordia, 2006). The same authors claimed that negative rumours were more prevalent than positive ones. Sullins (1991) added that negative emotions transfer faster than positive ones. Additionally, the author suggested that employee rumours and collective emotions are

[6] Martinko, M.J., Henry, W.J., and Zmud, R.W. (1996). An attributional explanation of individual resistance to the introduction of information technologies in the workplace. Behaviour and Information Technology, 15(5), 313-330.

[7] Joshi, K. (1991). A model of users' perspectives on change: The case of information system technology implementa-tion. MIS Quarterly, 15(2), 229-242.

connected. Other authors argued that rumours prosper when not addressed accordingly by organisations (Moulin, 2010).

In organisational teams, conflict behaviours do not immediately occur as conflicts in which all members are fully, equally involved (Jehn et al., 2013). Instead, such behaviours can be the result of a conflict that has occurred within a group of employees at some point in the firm's history, and that has also come to infect, or involve, other team members over the course of time (Jehn et al., 2013). While many frameworks of conflict behaviours exist, they comprise actions as engaging in process control, forcing, confronting, accommodating, compromising, problem-solving, and avoiding. Nevertheless, the IS research stream on the issue has been considering negative past experiences as a static phenomenon impacting the ongoing IT project with static and measurable consequences that often do not go beyond the perimeter of the project being studied. Indeed, a large body of research had observed the way prior failing attempts can negatively influence a new essay of an IT project. For example, previous failed projects of IS integration were seen as contributing to a bad image of ERP projects (Nelson, 2007; Markus et al., 2000; Davenport, 1998). Similar observations were made in Knowledge Management System (KMS) projects, Decision Support System (DSS), and Customer Relationship Management (CRM) projects. Negative as contrasted with positive prior experiences with an IT are related to attributions associated with failure, lowered expectations for success, negative affect, and rejection behaviours (Martinko et al., 1996). A sort of mistrust legacy may occur between successive IT projects if managers neglect the "resistance path dependency" phenomenon (Meissonier and Houzé, 2010). For instance, organisational path dependence specifically deals with inefficiencies occurred in the past that may "lock" organisations in old processes and stop them from creating new ideas (Bröring and Herzog, 2008; Liebowitz and Margolis, 1995). As a consequence, the firm will meet difficulties to shift into other alternatives even if the existing system stops providing positive reinforcement mechanisms, causing serious organisational inefficiency. Lock-in mechanisms can also occur in behaviours (Davis et al., 2005). Barnes et al. (2004) call these mechanisms behavioural lock-in, when an individual's behaviour becomes locked in because of habits, learning or culture inhibiting the firm in which s/he works.

In this research, I aim to fill this literature gap, and tackle a different point of view, considering prior and ongoing negative experiences toward an existing IT as a dynamic process that evolves, impacting not only similar IT projects but also distinct future ones. Indeed, insufficient research in IS has investigated the cross-resistance influence of negative past and

present experiences between projects far in terms of objectives, intended users, design, and functionalities.

Accordingly, I raise the first general research question: Could IT resistance be understood in the light of the portfolio of both past and present IT projects?

By managing change in independent IT projects separately, with different teams and even with different methods, organisations may unconsciously lose sight on the way users' attitudes may be interrelated through conflict contagion mechanisms, involving cross-resistance effects. Furthermore, according to Koening (1985), *"in a poorly managed organisation, they can chip away at morale and fuel anxiety, conflicts and misunderstanding"* (p. 55). Dasborough et al. (2009) also stated that the spread of negative emotions within organisational settings is particularly concerning as it can undermine organisational change efforts. Sanchez-Burks and Huy (2009) argued that scholars must bring into focus the patterns of shared emotions of different valence (e.g., positive and negative) as they may be particularly important for managers implementing organisational change. In other words, rumours are the vehicle by which contagion occurs in organisations (Dasborough et al., 2015).

Then, a second research problem arises, as to figure out how IS project management could be enriched to stop or prevent negative contagion effect.

More specifically, my research focuses on pursuing investigations on the resistance legacy of IT projects. Different "change management" methods exist that aim at minimising resistance, inducing readiness, and augmenting acceptance. The IS research stream on change management techniques is very rich and consists of several complicated yet contradicting techniques, as there is no "best way" to manage IT-induced change. More precisely, in the information technology context, scholars have developed change implementation techniques for antecedents of IS acceptance (Capaldo and Rippa, 2009; Shang and Su, 2004; Joshi 1991) based on technology acceptance models, Self-Determination Theory (Deci and Ryan, 1989), Expectancy Theory (Vroom, 1964), and critical success factors for change management in IS projects (Ziemba and Obłąk, 2015), among others. These studies, however, shed light on methods that aim to limit user resistance behaviours to IT projects without the possibility of anticipating them.

Moreover, most of the research effort made on the subject was empirically conducted on the limited perimeter of the new IT being implemented. Therefore, it can be considered to be observations made on downstream results of the upstream resistance process (Meissonier and Houzé, 2010), but also of cross-resistance effects between different IT projects in the firms surveyed (Bou Saba and Meissonier, 2016). Consequently, resistance behaviours are observed

as being task-oriented, related to the non-appropriateness of IT that users have to cope with, and as being socio-political oriented, related to matters of users' autonomy and power loss. However, few empirical studies have investigated the contagion mechanisms of such conflicts and ways to manage them, during previous IT deployment stages. A focus on pre-implementation phases is therefore essential, as IS managers need to anticipate potential conflict contagion effects that can lead to poor team outcome (Jehn et al., 2013).

For instance, tackling the effectiveness of various methods of inducing resistance to persuasive messages and attitude change has been a long-standing topic of interest among scholars of social influence (McGuire, 1964). McGuire's (1964) Inoculation Theory, seems to have a great potential for investigating a firm's ability to resist to conflicts occurring toward an IT tool. The theory uses a biological metaphor to describe an approach for conferring resistance to attitude change. By exposing individuals to messages containing a weakened argument against an attitude they hold, it is possible to ''inoculate'' future IT users against future attacks on the attitude (McGuire, 1964) and therefore protect them from being "contaminated" by other individuals. Inoculation has been applied in a variety of contexts, (e.g., social psychology and social sciences) as a resistance strategy (e.g., to social influences, persuasion, etc.), but very little in the IS field (Fagnot and Stanton, 2015). Many of these studies have demonstrated Inoculation as an effective stratagem. Indeed, prior work on the subject includes alcohol consumption prevention (Godbold and Pfau, 2000), commercial advertising (Pfau, 1992), political campaign issues (Pfau and Burgoon, 1988), public relations issues (Wan, 2004) and sexual harassment (Matusitz and Breen, 2006). Accordingly, it would be interesting to see whether Inoculation messages would help employees maintain pre-existing positive attitudes toward a recently-implemented IT while guarding them against undue conflict contagion from their colleagues. Accordingly, prior research studies argued that negotiations during IT implementation can raise affective-oriented resistance if users perceive threats concerning their values or power relationships because of expected organisational changes (Meissonier and Houzé, 2010; Lapointe and Rivard, 2005; Jiang et al., 2000; Zmud, 1980). Contrarily, in this research, I argue that threats can be used to warn individuals that other persons may attack their attitudes in the firm. Using Inoculation theory, "fighting fire with fire," may turn out to be an effective strategy to protect IT users from being "contaminated" by other individuals in the firm (Bou Saba and Meissonier, 2017).

❖ Action Research Project

▪ CIFRE Contract

My research project was based on a CIFRE contract (Convention Industrielle de Formation par la Recherche en Entreprise). CIFRE stands for Industrial Agreement of Training through Research. The CIFRE[8] doctoral student signs a three-year full-time work contract with a French company, during which the student must defend his/her thesis immediately, after the end of the contract. For instance, in my case, I was required to defend my thesis before December 2017, having signed the contract in October 2014.

An advantage of such contract is that the PhD student operates in the company as well as in his/her laboratory, to gain valuable experience in both worlds, while understanding their different research aims and approaches. The research undertaken by a CIFRE student sits within the framework of a public and private partnership between a French company and a laboratory and is formulated by both parties. My thesis was done in collaboration between the French company Efficient Innovation Corporation, and the University of Montpellier – the Montpellier Research in Management (MRM) research group. I was jointly supervised by both my academic thesis supervisor (Professor Régis Meissonier) and a scientific director (monitor) in the company (the firm's director-general). For the past 30 years, the French Ministry of Higher Education and Research has been funding this specific doctoral program within a public-private partnership framework. In research fields where the researcher performs his/her inquiry on "real-life scenarios" to improve the problematic situation, for instance, by introducing new management tools (e.g., knowledge management, performance management, IT, etc.), the methodology of action research is particularly adapted (Rasolofo-Distler and Zawadzki, 2013).

▪ Practical Problem

Efficient Innovation Corporation[9] (EI) is a French management consulting firm, founded in 1998, specialised in R&D management. EI is an SME (small and medium-sized enterprise) and has seven offices distributed all over France and one subsidiary in Sao Paolo (Brasil). One of EI's principal activities is R&D project portfolio management. The firm applies project prioritisation and selection methodologies in its assignments, using both human

[8] http://www.anrt.asso.fr/fr/espace_cifre/accueil.jsp#.WaWvF63pN-U

[9] http://www.efficient-innovation.com

and IT-based tools. For instance, EI assists its clients in determining the eligibility of their R&D projects, in a broad portfolio of technological projects, to the French public funding scheme, the Research Tax Credit (CIR).

France currently proposes an advantageous tax system for R&D among OECD[10] member states, namely its research tax credit called CIR[11]. In 2015, more than 16,000 companies declared eligible R&D expenditures, therefore benefitting from around 5.3 billion euros in CIR. France's CIR covers 30% of all R&D expenses, up to 100 million euros, and 5% above this threshold. Salaries for research staff are included, as are 50% of R&D operating costs, and 75% of investments in R&D operations. To secure declared R&D tax credits, organisations must gather increasingly convincing proofs and documentation to meet the government's requirements (e.g., project's state-of-the-art, scientific documentation on the project's novelty, R&D staff time sheets, subcontracting invoices, certified accounting sheets, etc.). The decision to declare projects in a portfolio as eligible to CIR is made concerning their fit with the R&D characteristics as defined by the Frascati Manual[12]. These projects must satisfy several and precise scientific criteria, to be considered as eligible to the research tax credit. Hence, the acquisition of the tax credit is a delicate task. There are so many conflicting pulls and pressures in favour of one project or the other, which need careful thought and planning before a decision is taken.

Hence, risk minimisation is the reason for which clients ask for EI's consulting services. Risks occur when a client firm benefits from CIR's tax incentive on non-or-partially eligible projects. In case of governmental control, the client firm might face legal sanctions ranging from partial to full restitution of the CIR gathered earlier, putting in jeopardy the company's treasury. In an attempt to reduce this risk to the minimum, the top management of EI designed the first version of a decision support system, to be used by its employees, whether junior or experienced ones, to help them establish more "secure" and less-risky CIR eligibility screenings for their clients.

A first version of the PMT was developed in-house by a group of experienced consultants before the project's start. The tool was tested and used a few times but was not yet

[10] The Organisation for Economic Cooperation and Development (http:// www.oecd.org)

[11] Crédit d'impôt recherche (http://www.enseignementsup-recherche.gouv.fr/pid24835/credit-impot-recherche-cir.html)

[12] Frascati Manual: Guidelines for collecting and reporting data on Research and Experimental Development (http://www.oecd.org/innovation/inno/frascati-manual.htm)

fully diffused to other consultants in the firm. No formal communication at EI took place to inform other consultants and key users on its intended objectives and on how it works. The PMT, in its first version, had few technical and ergonomic elements missing, according to a group of consultants who were expected to be the "early adopters" of the tool. These consultants expressed discomfort and demotivation, stating that they did not trust the PMT's technical capabilities nor the algorithm behind it. Consequently, several meetings gathered both the developers and the intended users of the tool in an attempt to fix the issues blocking its usage and develop a second version of the PMT. These meetings turned out to be unsuccessful, because no agreement was made on the fit between organisational needs and the PMT's characteristics, and a conflict between different groups arose causing the suspension of the DSS implementation project. At this point, the firm's director-general (DG), himself an ex-researcher in management science, decided to hire a doctoral student to tackle both the PMT upgrade project and conflict resolution side-by-side.

Consequently, as a PhD student in information systems, my thesis aimed to understand why the first version of the PMT had witnessed resistance behaviours by key employees at the firm. The purpose was to identify these conflicts in an attempt to solve them before implementing an upgraded version of the tool. This would be achieved by first developing research questions drawn from the literature on IS implementations in general practice, then trying to answer them with the principal general practice informants. Further details on the case description are provided in page 91, Chapter 2, section 2.1.2.

- **Thesis Plan**

The thesis is structured in five chapters. First, the choice of the research subject is justified, and the research objectives were briefly presented in Introduction, p. 19.

CHAPTER 1, p. 25, includes an overview of literature that provides a foundation for this research - Section 1.1, p. 26, is a review of the IS acceptance literature. The models that are discussed in this section are the adoption models whose constructs are mainly based on the Technology Acceptance Model. Section 1.2, p. 39, is a review of the IT resistance literature. The theories that are discussed in this section included the attribution theory, a definition of resistance types and forms, the equity implementation model, and a review of literature where resistance models alone, failed to explain IT implementation failure. Section 1.3, p. 53, is a review of the conflicts literature. The section shows the close relationship between conflict and resistance, as well as the orientations and types that might occur in organisations.

Section 1.4, p. 58, discusses the phenomenon of path dependency and institutional isomorphism as well as their relationships with both IT acceptance and resistance literature. Section 1.6, p. 64, is a review of the contagion literature. It discusses the similarities that can be made with other concepts in the IS literature. It also details the phenomenon of conflict contagion that occurs on the intra-group level. Section 1.7, p. 75, reviews the literature on Inoculation theory and on the ways how it could be used as a change management method. The last section (1.8, p. 82) provides a theoretical discussion and development resulting from the gap observed in the literature.

The methodology used in conducting this research is presented in CHAPTER 2, p. 87. Section 2.1.2, p. 91 provides a detailed case description, as of the research field of the action research performed. Section 2.2.4, p. 110, discusses the constructivist epistemological paradigm of my research, the motivation, and the reasons for which the thesis followed a qualitative research model of analysis, a canonical action research methodology, as well as a cyclical research design (Susman and Evered, 1978).

In CHAPTER 3, p. 118, I present the data analysis, the findings of this research, and several discussions on the results. The open coding process is also described, and the resultant categories are presented. The data collected from the empirical field are analysed and interpreted in the same chapter. Accordingly, the conceptual research models proposed in section 1.8 of chapter 1, p. 82, are discussed and modified.

CHAPTER 4, p. 218, further discusses the findings and implications of my study for IS managers and researchers. The chapter is divided into three sections. Section 4.1, p. 219, provides a brief summary of the results. Key findings include the following: emotional and behavioural contagion mechanisms were observed in Cycle 2 between two different IT projects. The latter were observed on two levels: between experienced consultants on one side; and between junior consultants and experienced consultants on the other side. More specifically, junior consultants joined the conflict along with their experienced peers because they were socially and professionally “attracted” to them. They tended to support their experienced colleagues in the conflict toward the ERP. As a consequence, junior consultants joined their colleagues along conflict lines, and engaged in conflicts toward both the ERP and the PMT. On the other hand, experienced consultants exchanged active discussions on the conflict issue with their “private support networks” leading to extending the conflict situation to other experienced consultants that were not previously engaged in the initial conflict.

Section 4.2, p. 226 presents a discussion of the theoretical and managerial contribution of my work to the field of information systems. I argue that the identification of task-oriented and socio-political oriented resistance behaviours toward an IT project is not always sufficient to diagnose and to solve the organisational problem being studied. First, my findings contribute to Martinko et al.'s (1996) IT attributional model, that is, the interviewed individuals engaged resistance behaviours toward an IT tool with different characteristics and objectives than the ERP. Indeed, the unexpected conflict situation was consistent with prior studies that showed that previous failing projects of IS integration were observed as contributing to a bad image of ERP projects. However, these studies had mainly observed resistance behaviours between successive and similar IT projects regarding functionalities. In my case, the two IT systems were far regarding objectives, users, design, and functionalities. Indeed, the ERP was a "ready-to-use" enterprise system for internal administrative purposes, whereas the PMT was an Excel-based application that aims to help consultants with R&D PPM assignments. Therefore, instead of focusing on conflicts toward one IT project, I argue that one should take into account similar negative behaviours toward other IT projects at the firm as they might altogether affect the organisation as a whole. Second, a contribution of my thesis is to propose a conceptual framework of "IT conflict contagion" between two different IT systems. Indeed, "IT conflict contagion" evolved in groups over time. Last but not least, I introduced the concept of "resistance path dependency" which is the process in which a firm faces similar resistance behaviours all along its path due to conflict contagion mechanisms occurring between its employees. Third, I designed Inoculation-based IT training sessions. They appeared to be beneficial not only in preserving persons with initially positive attitudes but also in adjusting negative attitudes in the desired attitudinal direction (the project's objectives) while protecting them from attack-induced consequences.

Last, the conclusion, p. 241, discusses the limitations of the current work and brings the dissertation to an end. The conclusion also outlines directions for future studies. Accordingly, I invite IS managers and researchers to reconsider their negative view of contagion phenomena, and switch from focusing on IT project change management methods confined to their respective perimeters, to a portfolio-based approach more adapted to the « butterfly effects » of resistances.

CHAPTER 1 - LITERATURE REVIEW

Over the past twenty years, research in the IS field has focused strongly on theoretical contributions around technology acceptance (Lee et al., 2003), conflicts (Meissonier and Houzé, 2010) and resistance (Van Offenbeck et al., 2013). Within the Social Science Citation Index (Dwivedi et al., 2012; Williams et al., 2009), more than 350 articles have been published on these theories over the past two decades. My analysis, both based on the "conflict-oriented" character of my research field, and on the Theory of Reasoned Action (TRA), considers that resistance is a behavioural dimension of conflict, in which individuals express a conflict through resistance acts (Meissonier and Houzé, 2010; Ajzen and Fishbein, 1980). That said, while an abundance of research in psychology and IS had examined how intra-group conflicts affect the IS project and group performance (Lapointe and Beaudry, 2014; De Wit et al., 2012; De Dreu and Weingart, 2003) or how these conflicts shall be reduced and managed (Meissonier and Houzé, 2010; Lapointe and Rivard, 2005), less research in IS has explored the dynamics of contagion underlying intra-group conflicts. Beyond the category it can be assimilated to, Jehn et al. (2013) observed that a conflict might over time come to influence, infect or involve other individuals, systems, processes or groups. My explicit focus is on what happens when conflict perceptions on one IT system are broadcasted to a different system in a firm through behavioural actions of the involved individuals.

Chapter 1, section 1.1, p. 26, presents a review of the literature on IT user acceptance. Section 1.2, p. 39, provides a review of the IT resistance literature. The section includes a discussion on the attribution theory, a definition of resistance types and forms, the equity implementation model, and a review of literature where resistance models alone, have failed to explain IT implementation failure. Section 1.3, p. 53, is a review of the conflicts literature. The section shows the close relationship between conflict and resistance, as well as the orientations and types that might occur in organisations. Section 1.4, p. 58, discusses the phenomenon of path dependency and institutional isomorphism as well as their relationships with both IT acceptance and resistance literature. Section 1.6, p. 64, is a review of the contagion literature. It discusses the similarities that can be made with other concepts in the IS literature. It also details the phenomenon of conflict contagion that occurs on the intra-group level. Section 1.7, p. 75, reviews the literature on Inoculation theory and on the ways how it could be used as a change management model. The last section (1.8, p. 82) provides a theoretical discussion and development resulting from the gap observed in the literature.

Introduction	Chapter 1 – Literature Review
. Research problem: Limited IS studies on contagion mechanisms between distinct IT projects. . Research contract & field: CIFRE thesis at Efficient Innovation Corporation.	. User acceptance, resistance, conflicts, contagion, path dependence, and Inoculation. . Theoretical discussion and development: Two conceptual models of IT conflict contagion, and Inoculation.

1.1 Acceptance Literature

Several psychological and social factors influence interactions between human beings and technology (Taiwo and Downe, 2013). Understanding the mechanisms that lead users to accept technology is of critical interest to IS research. Researchers have developed some theories and models to explain patterns of new technology acceptance because of the complexities involved in predicting human behaviours that lead to the success or failure of a human-technology relationship. More specifically, technology acceptance research is a mature field and has now been active for the past 25 years as technology has invaded several life activities. Consequently, models and technology acceptance theories have been developed or used to study Information Technology (IT) acceptance, including but not limited to: the Technology Acceptance Model (Davis, 1993) and extended TAM (Venkatesh and Davis, 2000), the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), the Motivational Model (Davis et al., 1992), the Theory of Planned Behaviour (Ajzen, 1991), the combined model of TAM and the Theory of Planned Behaviour (Taylor and Todd, 1995), the Innovation Diffusion Theory (Rogers, 1995) and the Social Cognitive Theory (Bandura, 1986). This section provides a review of the technology acceptance literature. Several acceptance models have been developed. Each model has its specific characteristics which are stated below. The purpose is to synthesise the major research contributions made on the subject in chronological order.

1.1.1 Theory of Reasoned Action (TRA)

In 1975, Ajzen and Fishbein were the first to introduce the theory of reasoned action. Further modifications were made in 1980 to include subjective norms that shape intention, which in turn influences an individual's actual behaviour (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). The theory states that individuals are rational decision makers who evaluate relevant behaviour beliefs in the process of forming their attitude toward the behaviour. Fishbein and Ajzen (1975) define attitude as *"an individual's positive or negative feelings about performing the target behaviour"* (p. 216). TRA links an individual's intention with the perception, norms, and attitudes within the decision-making process to predict the behaviour which may result because of this intention. In other words, individuals craft their attitudes toward a behaviour by evaluating their beliefs through an expectancy-value model. For each attitude formed, humans multiply the strength of their belief by the outcome evaluation and then sum the entire set of resulting weights to craft the final attitude. Consequently, an individual's behaviour (e.g., to accept or not accept something) is determined by one's intention to perform the behaviour. Subjective (or affective) norms are also important constructs in TRA. Fishbein and Ajzen (1975) define subjective norms as *"the person's perceptions that most individuals who are important to him think he should or should not perform the behaviour in question"* (p. 302). According to the same theory, affective evaluation is *"an implicit evaluative response"* (Fishbein and Ajzen, 1975, p. 29) to the consequence. Attitude alone does not determine behavioural intentions. Instead, intentions are also determined by subjective norms, which in turn, are determined by an individual's normative beliefs and motivation to comply with perceived norms (see Figure 1). Consequently, TRA represents an information processing view of attitude change and attitude formation because of external stimuli that influence these attitudes through variations in the person's belief structure.

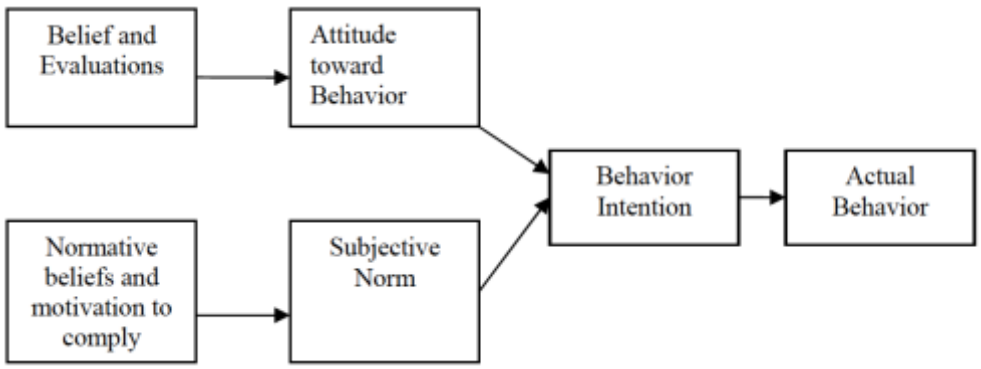


Figure 1: The Theory of Reasoned Action (Fishbein and Ajzen, 1975)

TRA is a generalised model for understanding the determinants of human behaviour in situations where people may make use of their choices. The model has been used to make accurate predictions of human choice in situations as diverse as elections voting (Bowman and Fishbein, 1978) or alcoholic beverages consumption (Schlegel et al., 1992). For instance, the authors found that the theory worked well in predicting options among alternatives. In their meta-analysis, the same authors concluded that the theory was robust and offered strong predictive functions, even when used to study situations from outside the original boundary conditions of the theory. In the field of IS, the TRA has been the backbone for technology acceptance models (Davis et al., 1989).

1.1.2 Social Cognitive Theory (SCT)

In 1986, Albert Bandura developed the Social Cognitive Theory (SCT). SCT posits that human behaviour is a triadic, dynamic and reciprocal interaction of personal factors, behaviour, and the environment (see Figure 2).

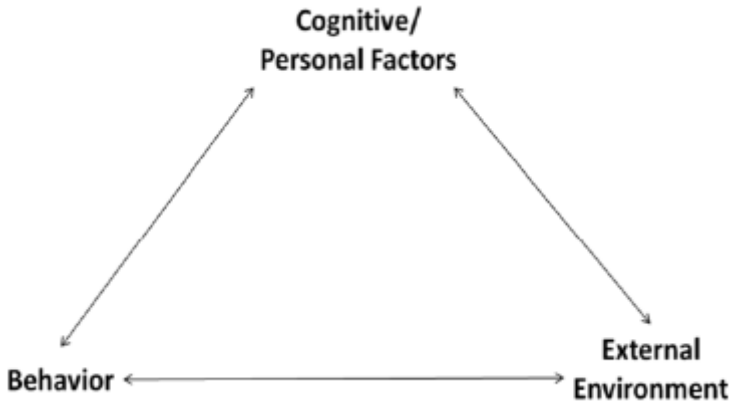


Figure 2: Social Cognitive Theory (Bandura, 1986)

According to Bandura (1986), learning occurs in a social context where behaviours, personal factors, and external environmental factors interact together reciprocally. The same authors state that individuals acquire and maintain behaviour taking into consideration the social environment in which they develop the behaviour. More specifically, an individual's behaviour is uniquely determined by each of these three factors. While the SCT supports the behaviourist approach that response consequences mediate behaviour, it argues that behaviour is largely regulated antecedently through cognitive processes. Compeau et al. (1999) argue that SCT is one of the most powerful theories of human behaviour. Regarding technology acceptance, an individual’s cognitive skills influence the behaviour of accepting a technology.

Furthermore, successful interactions with technology also influence cognitive perceptions (Compeau et al., 1999). SCT refers to the concept of "self-efficacy" (Compeau et al., 1999), defined as *"the judgment of an individual's ability to use technology to accomplish a particular job or task"* (Compeau and Higgins, 1995). One's resulting behaviour is highly influenced by his very own outcome expectations, including personal and performance-associated ones (Compeau and Higgins 1995). Personal-oriented outcome expectations are associated with one's self-esteem and sense of success. Performance-oriented outcome expectations are more job/profession-related. According to Compeau and Higgins (1995), self-efficacy influences both personal and performance-oriented outcome expectations. For instance, affect, and anxiety are the two affective factors (Venkatesh et al., 2003). Affect refers to an individual's penchant toward a behaviour (e.g., willing to use IT). Anxiety refers to an individual's emotional reaction in performing a behaviour (e.g. feeling threatened by the new IT).

1.1.3 Technology Acceptance Model (TAM)

The TAM was first developed by Fred Davis in 1986 during his doctoral thesis. Davis (1989) based his model on the Theory of Reasoned Action. His goal was to investigate the factors that lead individuals to accept or reject IT. Accordingly, Davis et al. (1989) contributed to the TRA by linking organisational behaviour concepts with technological ones (see Figure 3).

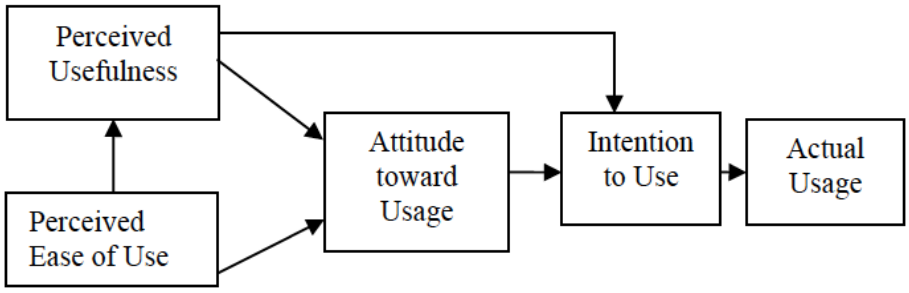


Figure 3: The Technology Acceptance Model (TAM) (Davis, 1989)

According to the same author, two important factors of individual beliefs are: perceived usefulness and perceived ease of use. Based on the expectancy-value model underlying the TRA, perceived usefulness is defined as *"the degree to which individuals trust that using a particular IT would enhance their job performance"* (p. 320). Perceived ease of use is defined as *"the degree to which a person believes that using a particular system would be free of effort"* (p. 320). These behavioural beliefs hence lead to an individual behaviour intention and an

actual behaviour. Furthermore, Davis argues that perceived usefulness is the strongest predictor of one's intention to use IT. Shroff et al. (2011) stated that by manipulating these two determinants, IS designers can have better control over users' beliefs toward the IT and therefore can predict their behavioural intention and actual IT usage before deployment. However, because of the weak generated psychometric results, TAM does not include subjective norms (Wu et al., 2011; Davis et al., 1989). IS researchers have consequently criticised the model for not including subjective factors. Nevertheless, including subjective norms in TRA is known to also have psychometric issues according to Malhotra and Galletta (1999). The same authors argue that although "behaviour intention" does not seem to have a direct relationship with social influence (inducing subjective features), it does, however, seem to have a relationship with "attitude." Furthermore, despite that TAM had been considered as the most pertinent and powerful to study the adoption of IT in firms (Sharma and Chandel, 2013), IS researchers continue to point out that the model lacks important variables and does not consider barriers that may prevent individuals from adopting a technology (Bogozzi, 2007; Taylor and Todd, 1995).

1.1.4 Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) was developed by Ajzen in 1991, extending TRA to include not only voluntary situations but also mandatory ones (see Figure 4). The TPB is similar to the TRA because it assumes that individuals are rational decision makers – they assess perceived behaviour control using a method akin to the expectancy-value model. For each set of control beliefs, individuals multiply the belief's strength by the perceived power of the control factor. Taylor and Todd (1995) argue that perceived behavioural control is the perceptions of internal and external constraints on behaviour. Through TPB, Ajzen (1991) added a new dimension called *"perceived behavioural control,"* defined as *"the perceived ease or difficulty of performing the behaviour"* (p. 188).

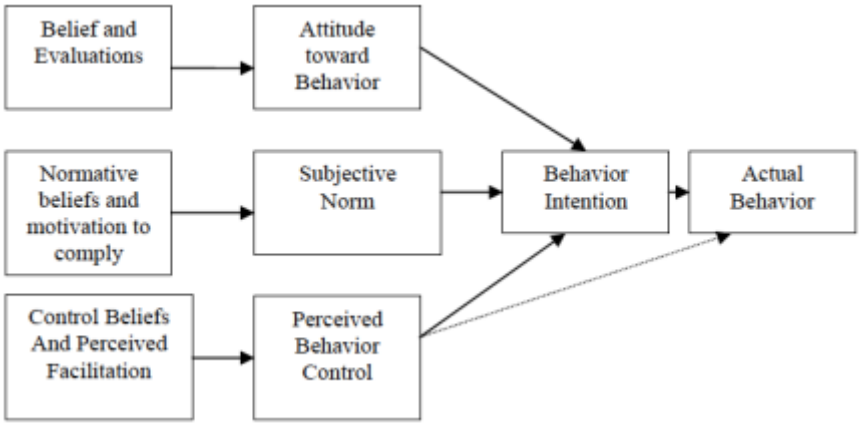


Figure 4: The Theory of Planned Behaviour (Ajzen, 1991)

According to the TPB, attitudes, subjective norms and perceived behavioural control predict the intention which in turn predicts behaviour before it occurs. In IS research, TPB had been widely applied to understand acceptance and use of different technologies (Harrison et al., 1997; Taylor and Todd 1995b; Mathieson 1991).

1.1.5 Model of Personal Computer Utilization (MPCU)

Thompson et al. (1991) developed MPCU based on the following definition of their model: *"Behaviour is determined by what people would like to do (attitudes), what they think they should do (social norms), what they have usually done (habits), and by the expected consequences of their behaviour"* (p. 126). Their model deals with the extent of Personal Computer (PC) utilisation by a worker who has the choice whether to use or not the PC (the employer does not impose usage). In such a context, the authors posit that the use of PC by the worker is likely to be influenced by several factors: for instance, his/her feelings (affect) toward using computers in general, prevalent social norms regarding the use of computers in the workplace, general habits linked with computer use, expected outcomes by the worker for using the computer, and finally, the working conditions at work that facilitate using the computer (see Figure 5).

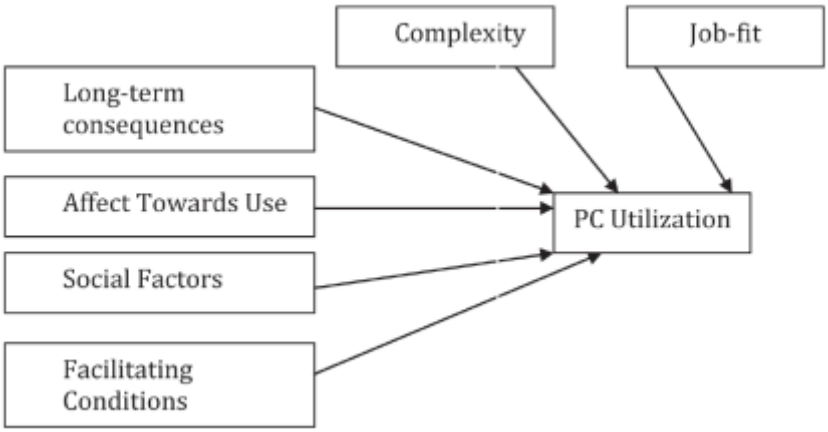


Figure 5: The Model of Personal Computer Utilization (Thompson et al., 1991)

According to (Venkatesh et al., 2003), the nature of the model makes it particularly suited to predict workers' acceptance and use of an IT in organisations. Thompson et al. (1991) used their model for predicting usage behaviour rather than an intention to use. Social factor has been considered as a determinant that influences human behaviour. According to Asch (1995), individuals tend to conform with the majority's opinion or have it as a base for their decisions. Social influence can be classified into two types (Deutsch and Gerard, 1955): normative and informational social influence. According to the authors, normative social influence is an influence to conform to the positive expectations of others. Informational social influence is an influence to accept information obtained from others as evidence about reality. For instance, Fishbein and Ajzen (1975) posit that subjective norms can be considered as a sort of normative social influence.

1.1.6 Motivation Model (MM)

The motivation model posits that the individual's behaviour is based on intrinsic and extrinsic motivation. The model was developed by Davis et al. (1992) to study ICT adoption and use. Intrinsic motivation is born from one's inner drive to perform the task depending on his/her perception of satisfaction and pleasure (Davis et al., 1992), whereas extrinsic motivation arises because of external motivation triggers, outside the very person or the task s/he is required to perform (Cheng and Yeh, 2009). The principal determinant of intrinsic motivation is enjoyment (Venkatesh, 2000; Davis et al., 1992). For instance, if performing an activity leads to a feeling of pleasure and results in satisfaction for the individual, for no apparent reinforcement other than the process of performing the activity per se, such behaviour can be classified as intrinsic motivation (Vallerand, 1997). On the other hand, the determinants of extrinsic motivation are: perceived usefulness, perceived ease of use, and other subjective

norms, because extrinsic motivation is *"perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions"* (Davis et al., 1992, p. 1112).

1.1.7 Combined TAM – TPB

TAM-TPB were combined by Taylor and Todd (1995) that proposed a hybrid model through the fusion of TPB predictors with the constructs of perceived usefulness and ease of use of TAM (see Figure 6). It is also known as the *"decomposed"* theory of planned behaviour, because the belief structure is decomposed in this model (Lau, 2011). Attitude is therefore decomposed to be affected by perceived usefulness (relative advantage), perceived ease of use (complexity) and compatibility. The normative belief structure is affected by peer influence and superior influence. The control belief structure is influenced by self-efficacy and resource facilitating conditions, for instance, technology facilitating conditions.

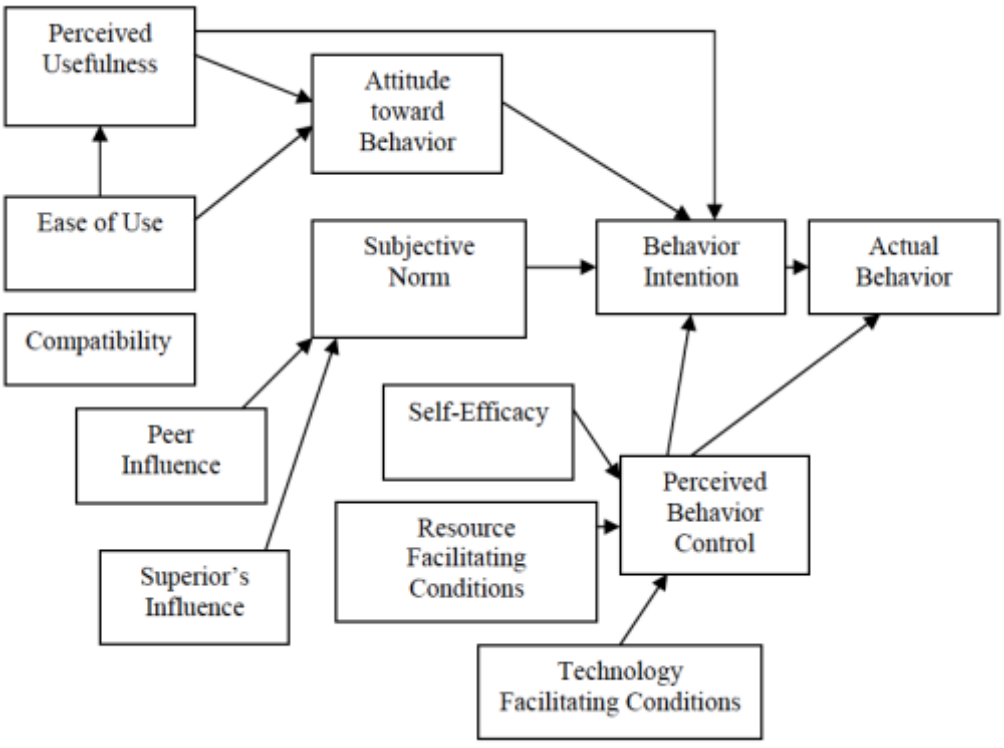


Figure 6: Combined TAM and TPB (Taylor and Todd, 1995)

1.1.8 Innovation Diffusion Theory (IDT)

Rogers (1995) developed IDT. According to the author, innovation could be an object, idea, process, or practice that is new, whereas diffusion is the process through which innovation gets into the social system (Rogers, 1995). IDT is a key theory of innovation/technology acceptance used in both individual or organisational contexts. Rogers (1995) proposed key

factors affecting the adoption of any innovation in an attempt to reduce uncertainty about it. Accordingly, he proposed five determinants of the rate of innovation that affect adoption and acceptance behaviour: relative advantage, compatibility, complexity, trialability, and observability (see Figure 7).

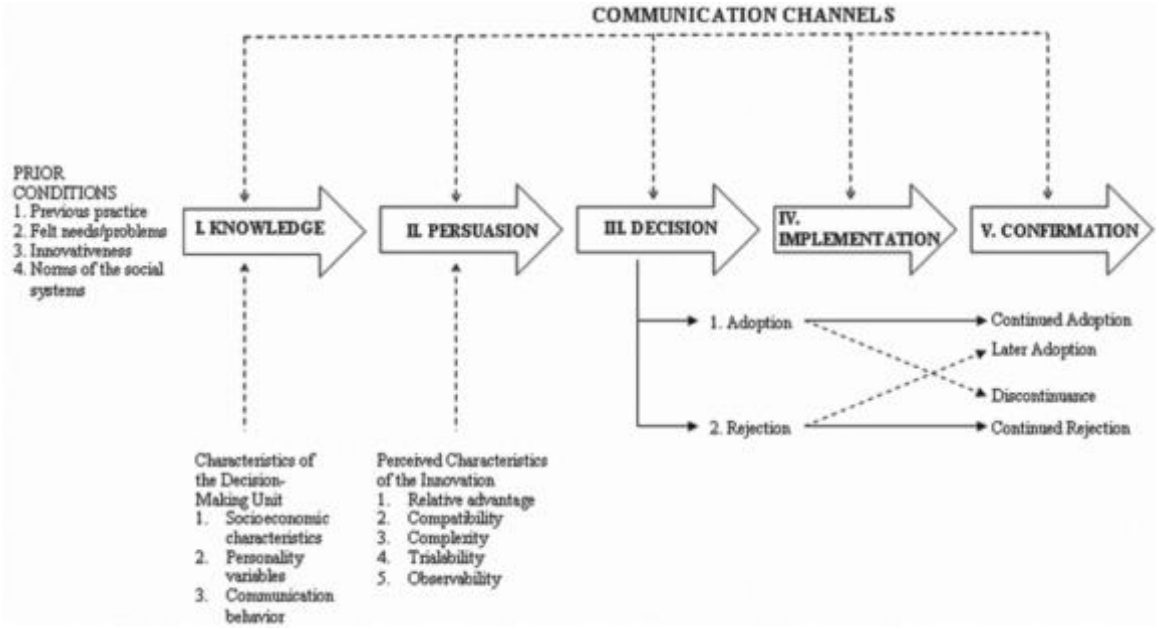


Figure 7: Innovation Diffusion Theory (Rogers, 1995)

Rogers (1993) argues that five categories of innovation adopters exist: innovators, early adopters, early majority, late majority, and laggards. Sometimes, a sixth group is added: non-adopters. The author estimated the percentage of each category as illustrated in Figure 8 below.

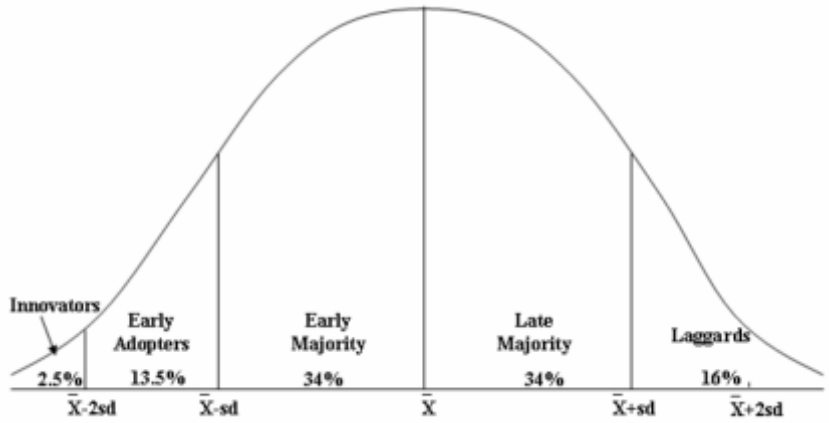


Figure 8: The Distribution of Innovation Adopters (Rogers, 1995)

1.1.9 Extension of TAM (TAM2)

TAM2 consisted on including social influence features such as subjective norms, and cognitive instrumental processes such as job fit and perceived ease of use. Venkatesh and Davis

developed this extension in 2000. Its purpose is to predict information technology acceptance (see Figure 9). Accordingly, TAM2 maintains the principle of perceived ease of use from the original TAM as a direct determinant of perceived usefulness.

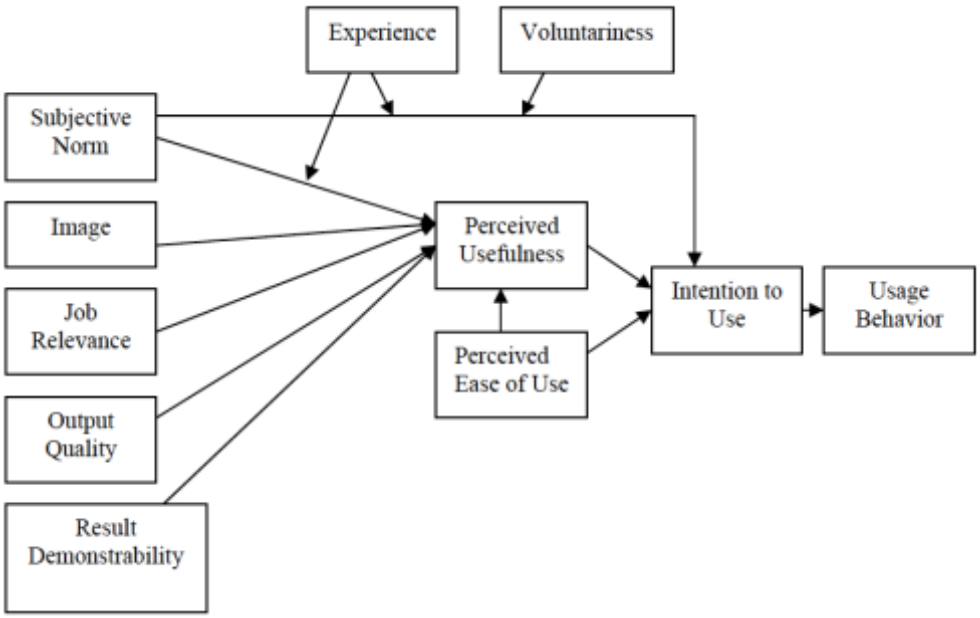


Figure 9: Extended Technology Acceptance Model (Venkatech and Davis, 2000)

Two moderating variables in TAM2 are: experience and voluntariness. Unlike TAM, the variable of attitude was removed in TAM2 (Wu et al., 2011). On the other hand, despite that the TAM posits that the influence of subjective norms on behavioural intention can be disregarded and so subjective norms are not considered. However, in TAM2, Venkatesh and Davis (2000) decided to reconsider these variables.

1.1.10 Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT), arguing that it *"provides a useful tool for managers needing to assess the likelihood of success for new technology introductions and helps them understand the drivers of acceptance"* (p. 425). Venkatesh et al. (2003) developed UTAUT based on the most significant constructs from the nine eight theories and models (see Figure 10). The UTAUT model used three main determinants of usage and intention: performance expectancy, defined as *"the degree to which the user expects that using the system will help him or her attain gains in job performance"* (p. 447), effort expectancy, which is *"the degree of ease associated with the use of the system"* (p. 450), and social influence, as for the degree to which an individual is influenced by what others believe if s/he should use the new IT (p. 451). An additional

determinant of usage added by Venkatesh et al. (2003) was the influence of facilitating conditions, moderated by the user's age and experience. Facilitating conditions reflect the extent to which an individual believes that the organisational and technical infrastructure is capable of supporting IT use (Venkatesh et al., 2003).

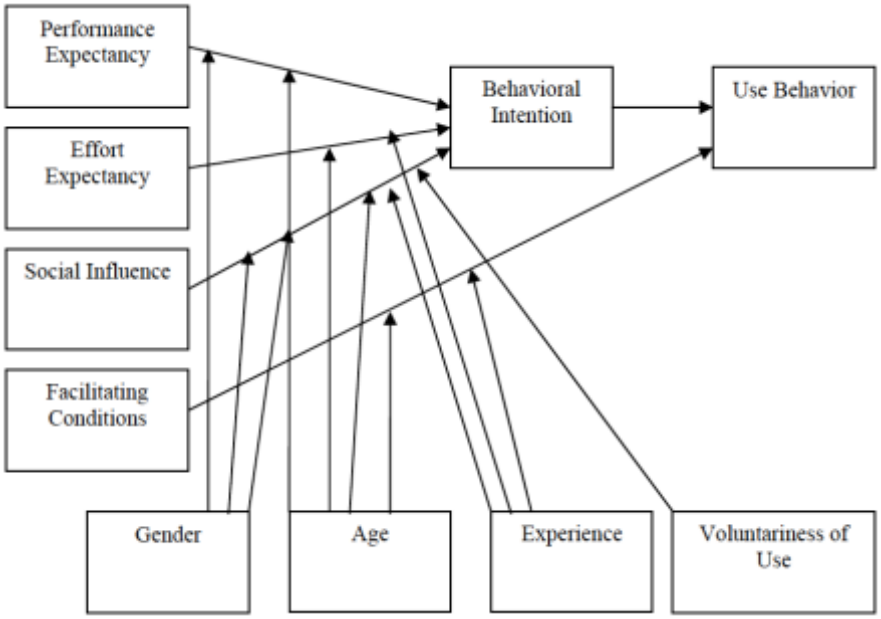


Figure 10: Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

1.1.11 Technology Acceptance Model 3 (TAM3)

Venkatesh and Bala (2008) brought the third modification into TAM to further shed light on the notion of *"perceived ease of use."* Additionally, the same authors added the dimensions of computer self-efficacy, the perception of external control, computer anxiety and computer playfulness. Two adjustment variables were added: perceived enjoyment and objective usability. Venkatesh and Bala (2008) argue that TAM3 is constructed on a theoretical framework of four classifications which synthesise all prior research done on TAM. These four classifications are: individual differences, system characteristics, social influence and facilitating conditions (see Figure 11).

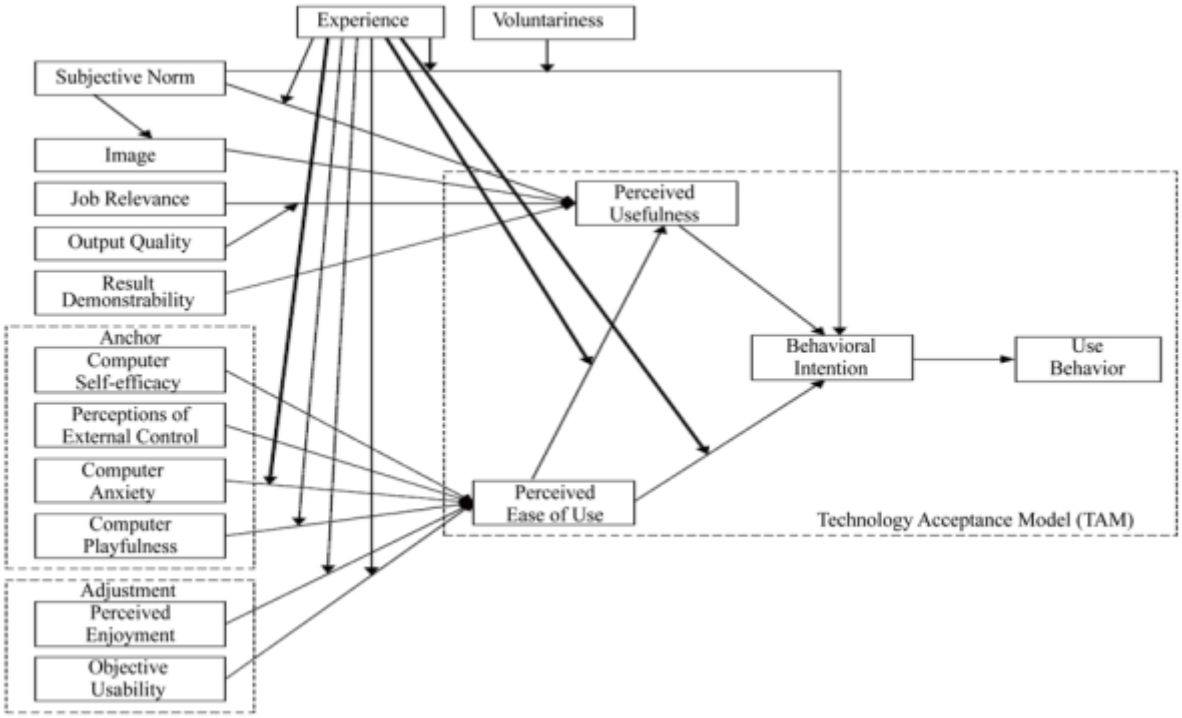


Figure 11: Technology Acceptance Model 3 (Venkatesh and Bala, 2008)

In TAM3, the perceived ease of use reflects computer self-efficacy, computer playfulness, computer anxiety, the perception of external control, perceived enjoyment and objective usability. On the other hand, the perceived usefulness reflects subjective norms, job relevance, result demonstrability, and image. Nevertheless, one of the criticisms of the model is that there are too many variables and too many relationships between the variables, which makes the model complicated to use.

1.1.12 Extension of UTAUT (UTAUT2)

Venkatesh et al. (2012) extended the UTAUT (see Figure 12) to include key additional constructs and relationships, tailoring the original model to a consumer use context. Consequently, the authors kept all independent variables of UTAUT but added three more which are: hedonic motivation, price value, and habit. Additionally, by combining these three salient constructs into UTAUT, Venkatesh et al. (2012) expanded the overall framework on technology use. UTAUT2 includes age, gender, and experience as moderating variables; however, voluntariness was ignored.

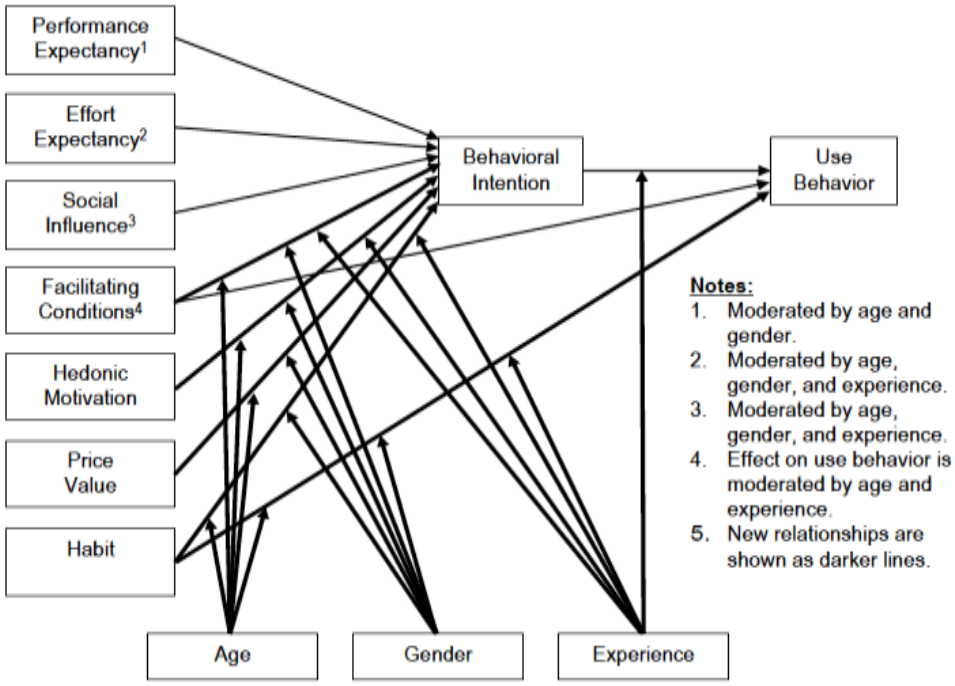


Figure 12: Unified Theory of Acceptance and Use of Technology 2 (Venkatesh et al., 2012)

1.1.13 Conclusion of the Acceptance Literature

Information systems researchers have been enquiring about the intentions behind an individual's use of technology (Williams et al., 2009; Hirschheim, 2007). The most popular model applied across a wide range of studies is the Technology Acceptance Model (TAM). It posits that technology use is conditioned with an individual's intention to use a specific system along with the perceived ease of use and the perceived usefulness of that system (Davis et al., 1989). Accordingly, Venkatesh (2006) points out that little research has been focusing on the factors influencing resistance. More specifically, Joshi (2005) argues that IT users may decide to accept or to resist a new IT based on their evaluation of the change associated with the new project. Cenfetelli (2004) stated that the intention to resist IT implementation is not just the other side of an intention to use it. Hence, resistance is not exactly equivalent to non-acceptance because non-acceptance may be caused by other factors such as not being aware of the existence of new technology. Nevertheless, according to Bhattacherjee and Hikmet (2007a), resistance means that a new IT was considered then later rejected by the users. Therefore, it would be interesting to enquire about the separate yet very related resistance literature, as it is often associated to open hostility to stop change, while non-acceptance may not necessarily engender such outcomes.

1.2 Resistance Literature

In the management literature, resistance is defined as a multifaceted phenomenon which causes unanticipated delays, costs, and distortion into the process of strategic change (Ansoff, 1988). User resistance is manifested through acts that defy the wishes of others (Ashforth and Mael, 1998; Hirschheim and Newman, 1988). Klaus and Blanton (2010) classify user resistance as the behavioural expression of a user's opposition to system implementation, during implementation. Theories that tackle user resistance toward IT deployment, during different implementation phases, have been witnessing development over the past ten years (Van Offenbeek et al., 2013; Klaus and Blanton, 2010; Kim and Kankanhalli, 2009; Ferneley and Sobreperez, 2006; Lapointe and Rivard, 2005). User resistance issues are of primary focus in IT related projects. In today's organisational context, investigating user resistance has been gaining considerable attention in the IS literature as information technology is being implemented extensively. Goodhue and Thompson (1995) argue that user resistance must be understood since it has been found to be *"at the root of many enterprise software project failures."* Gravenhorst and Veld (2004) suggest that change and resistance go hand in hand. Behaviour is the primary dimension of resistance (Lapointe and Rivard, 2005). Resistance occurs when a person perceives a situation as inequitable. User resistance is more specific than overall resistance to change because it consists of employees interacting with a system (Klaus and Blanton, 2010). Klaus and Blanton define user resistance as *"a behavioural expression of users' opposition to a system deployment during the deployment."* More recently, user resistance has also been identified as a key factor for successful IT deployment as researchers have been employing psychological foundations that date back as early as the 1980s (Markus, 1983). According to Venkatesh and Davis (2000), user resistance is considered as the opposite of acceptance. Conversely, other authors such as Van Offenbeek et al. (2013) and Meissonier and Houzé (2010) observed how users could similarly accept and resist to IT. Lapointe and Beaudry (2014) finally state that *"acceptance and resistance are mindsets comprising three dimensions: emotions, cognition, and attitudes, and that the related behaviours are manifestations of these mindsets."* Markus (1983) states that IT development is a political beast as well as a technological animal in which resistance is not a problem to be solved, but more a useful clue as to what went wrong. King and Anderson (1995, p. 168) describe user resistance as a *"complex kaleidoscope of interrelated factors."* In the IT context, user resistance is defined as behaviour intended to prevent the implementation and the use of new IT, or to prevent IS designers from achieving their objectives (Markus, 1993).

1.2.1 Attribution Theory

Heider (1958) originally proposed the attribution theory claiming that individuals' beliefs about their outcomes are essential determinants of subsequent behaviours. Weiner (1983) agreed on this assumption and later lightly adjusted it. The two authors worked on explaining achievement motivation as well as on developing several attributional models of achievement motivation. Consequently, a general paradigm evolved, and was supported by empirical literature (Evans, 1986; Martinko and Gardner, 1982). On the other hand, Learned Helplessness (LH) Theory is a particularly relevant aspect of Attribution Theory. Martinko and Gardner (1982) argue that LH refers to the passive behaviour resulting from prior exposure to failure, although changes in organisational conditions or circumstances may have occurred. Accordingly, individuals' attributions are primary motivational forces that condition their future behaviours (Seligman, 1990). Martinko et al. (1996) proposes an *"Attributional Model of Reactions to Information Technologies - AMRIT"* (see Figure 13) based on relationships suggested by the psychological literature on attributions (Abramson et al., 1978), models of organisationally-induced helplessness (Martinko and Gardner, 1982), and the literature on math anxiety (Kloosterman, 1988).

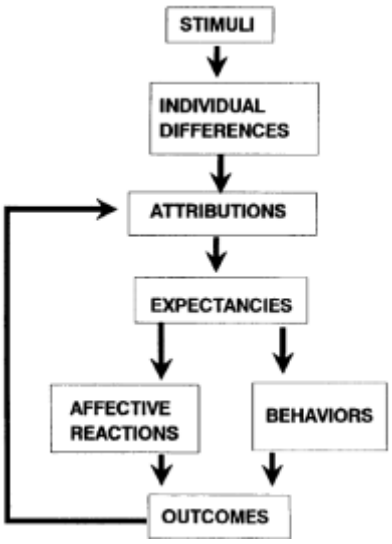


Figure 13: An Attributional Paradigm of Achievement Motivation (Martinko et al., 1996)

- Factors Influencing Attributions

The AMRIT model (see Figure 14) posits that causal attributions are evoked when a new technology is introduced along with other external environmental factors and internal intrapersonal influences combined with prior success or failure at tasks involving IT (Martinko et al., 1996). The resulting attributions would in turn influence individuals' expectations on the

outcomes of future performance which then evoke affective and behavioural reactions to the implementation and use of the IT. The resulting behaviours, or lack of behaviours, result in successful or unsuccessful outcomes, which later induce cues for future attributions regarding the focal IT. According to Lord and Maher (1990), the feedback loops throughout the model show that the variables are dynamic and interactive, unlike previous models of LH that rather suggest a linear form (Alloy and Abramson, 1982; Abramson et al., 1980). Consequently, the AMRIT model posits an interactive approach recognising the individual as an active organism, which is continuously receiving information from its environment and is obliged to perform within that environment (Munton, 1985).

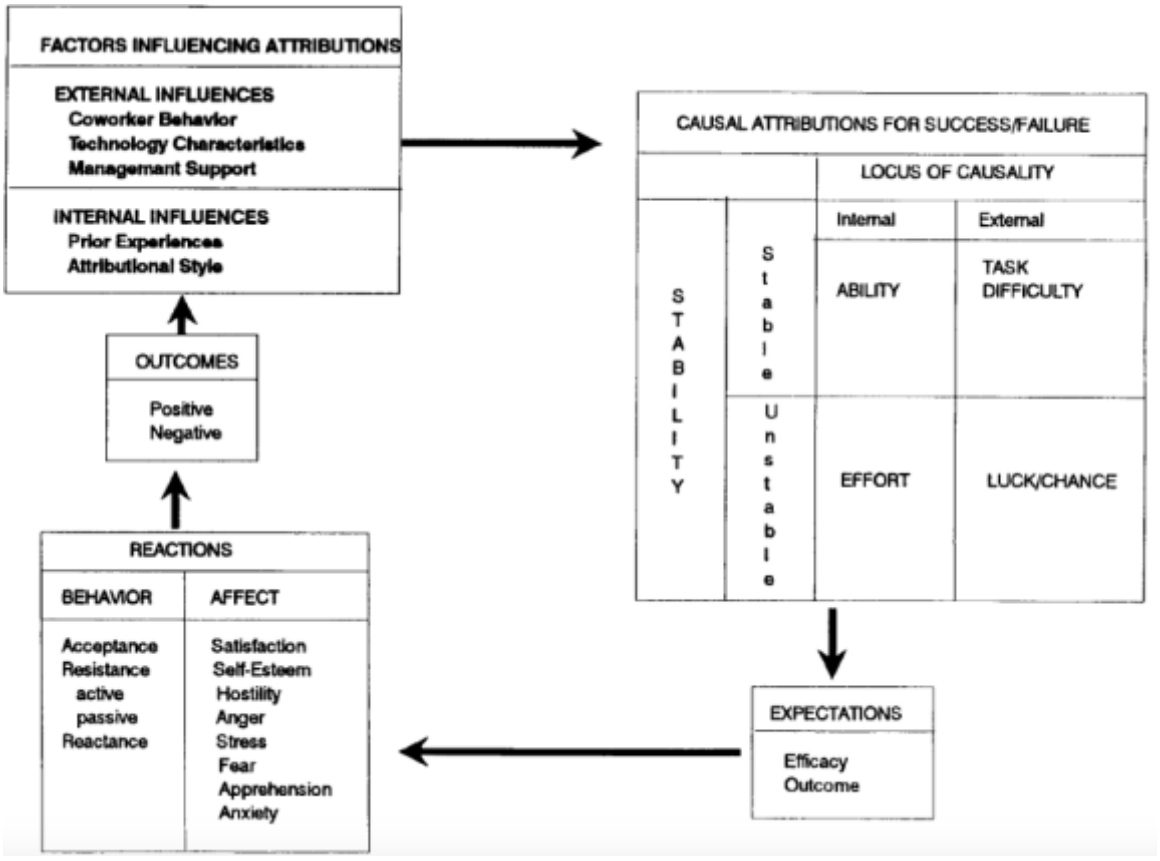


Figure 14: An Attributional Model of Reactions to IT (Martinko et al., 1996)

According to Martinko et al. (1996), the model's major constituent element is that an individual's attributions are formed and evolve during and after IT implementation. For instance, in the case of a new IT implementation project, these attributions may take form from a generalised attributional scheme based on what the individual interprets to be related to prior experiences (Gioia, 1986). However, with more familiar IT and after a person has already had some experience with a specific technology, these attributions will be more finely articulated and will reflect actual experiences. Therefore, some of the model's factors may have a stronger

impact at the first stages of IT implementation, while other factors may be more salient, as experience is acquired during or after implementation (Chi et al., 1981). External influences are variables that consist of an individual's immediate environment which affects attributions and expectations. These influences manifest themselves through the following: (1) other actors in an individual's immediate work environment such as coworkers and supervisors, (2) characteristics of the new IT being introduced into this workplace, and (3) management support (see Table 1).

Source	**Principle**	**Authors**
Co-workers and supervisors	Sources of information such as vicarious experiences and verbal persuasion may contribute to expectations of response-outcome non-contingency. If a supervisor or co-worker resist to the new IT and places specific blame for failure, so might the individual.	Martinko et al., 1996; Schmitz and Fulk, 1991; Mankin et al., 1985
Technical and technological characteristics	The perceived usefulness of an IT is positively related to the development of the individual's expectations and attributions regarding the IT.	Martinko et al., 1996; Mathieson, 1991; Davis et al., 1989; Swanson, 1987
Management support	Management support is positively related to user acceptance regarding the IT implementation.	Martinko et al., 1996; Leonard-Barton and Deschamps, 1988; Ettlie et al., 1984

Table 1: External Influences that Affect Attributions

Information and biases from an individual's past experiences and learnings are one of the factors that shape internal influences (Kloosterman, 1984) (See Table 2). Although these factors seem relevant, empirical support for these, and for many of the relationships suggested in the literature, is lacking. Few empirical studies argue that negative prior experiences associated with IT may cause the rejection of the new IT. For example, Kraut et al. (1989) found that as service representatives of a large company used computers more, they developed more negative attitudes toward them, finding them dehumanising and unlikely to have a productive impact on job performance (Kraut et al. 1989). Accordingly, the literature discusses the process by which past failure experiences may result in attributions that affect future expectations and behaviours. On the other hand, the literature also includes other attributional dispositions (e.g., locus of control) that evolved into the notion of "attributional style" (Martinko et al., 1996; Seligman and Schulman, 1986). Attributional style (also called explanatory style) can take two forms: "pessimistic" or "optimistic, depending on how the explanation fits along the three dimensions of internality, stability, and globality (Alloy et al. 1984). For instance, a pessimistic style is defined as the tendency to trust that the causes of a

"bad event" are due to factors which are internal, stable, and global (Seligman and Schulman, 1986; Abramson et al. 1980). On the other hand, individuals that have optimistic styles, attribute failures to external, unstable, and specific factors.

Source	Principle	Authors
Prior experiences	Negative as contrasted with positive prior experiences with an IT are related to attributions associated with failure, lowered expectations for success, negative affect, and rejection behaviours.	Martinko et al., 1996; Kraut et al., 1989
Optimistic attributional style	Optimistic attributional styles are positively related to external, unstable and specific attributions for IT implementation failure but to internal, stable and global attributions for IT implementation success.	Martinko et al., 1996; Seligman and Schulman, 1986; Abramson et al., 1980
Pessimistic attributional style	A pessimistic attributional style is characterised by the tendency to believe that the causes of a "bad event" are due to factors which are internal, stable, and global.	Martinko et al., 1996; Seligman and Schulman, 1986; Abramson et al., 1980

Table 2: Internal Influences that Affect Attributions

- Casual Attributions

Attributions reflect the individuals' beliefs regarding the reasons for their outcomes. The most popular paradigm for detailing this process shows attribution as a function of two dimensions: locus of causality and stability (Weiner, 1988; Weiner et al., 1971). Locus of causality is concerned with whether the individual attributes performance outcomes to internal or external factors (Weiner, 1985b). Internal causes are those within the individual, while external causes are those the individual cannot control (Martinko and Gardner, 1982). The stability factor is about the temporal nature of attributions. Stable attributions refer to factors that remain constant over time while unstable factors fluctuate over time. Combining the dimensions of stability and locus of causality, Weiner (1972) presents four potential achievement related to attributions: effort (internal/unstable), ability (internal/stable), task difficulty (external/stable), and luck/chance (external/unstable). Consequently, individuals believe that their chances of success and failure with a new IT are a function of their efforts, abilities, the difficulty of using the IT, luck/chance, or some combination of these four (Martinko et al., 1996).

- Expectations

Expectations refer to a person's belief that s/he can accomplish a task and the belief that task accomplishment leads to certain outcomes (Martinko et al., 1996). Bandura (1977)

argues that expectations have two components. The first is self-efficacy, which is the belief that an individual can perform a specific task. Therefore, self-efficacy directly deals with an individual's expected performance levels (Kirsch, 1986). The second type of expectancy is an outcome expectation defined as an individual's perception that a given behaviour will lead to certain outcomes (Bandura, 1977).

- Reactions to IT

The two classes of reactions to IT are the following: behavioural and affective. While a variety of potential behavioural reactions to the new IT implementation are possible, these responses can be classified into three categories: acceptance, resistance, and reactance. Affective reactions refer to emotional responses that result from attributions and expectations regarding likely performance outcomes. User dissatisfaction is the most common affective reaction associated with IT failure. Other studies added apprehension, anxiety, stress and fear as recognised affective reactions to computers and related technologies (Igbaria and Chakrabarti, 1990; Szewczak and Gardner, 1989).

1.2.2 Resistance Types

Individuals express resistance behaviours to IT in active or passive form. The active form is usually visible and relatively easy to detect, whereas the passive form is difficult to deal with and harder to detect (Tetlock, 2000; Jiang et al., 2000a). Lapointe and Rivard (2005) argue that such behaviours are lower at the individual level than on the group level. According to Coetsee (1999), there are four types of resistance:

1. Aggressive resistance: when individuals use threatening techniques, blackmails or boycotts in an attempt to stop the project completely;
2. Passive resistance: when individuals adopt a behaviour that aims to maintain the existing system and therefore to slow down or to stop the changes associated with the new system. Individuals adopting passive resistance behaviours may express arguments in favour of the so-called benefits of the system and the rules already in place;
3. Active resistance: when individuals adopt a "constructive" behaviour aiming to negotiate the terms of change or even to bring improvements into the IT project;
4. Apathy: when individuals adopt a behaviour of indifference, passive resignation and disinterest toward a situation, despite them being aware of changes.

According to Coetsee, apathy is also called "neutral zone" and represents a state of transition between resistance and acceptance. Coetse (1999) however adds that each individual has his/her way to dealing with change. This is because some individuals may accept changes involved while other can completely reject them. Furthermore, individuals can comprehend differently the threats coming from the same object depending on the initial distribution of power (Markus, 1983) or established routines (Marakas and Hornik, 1996).

1.2.1 Resistance Sources

According to Val and Fuentes (2003) who worked on extending the findings of Rumlet (1995), user resistance can be divided into five groups (see Table 3). The first three groups deal with formulation sources, and the last two groups deal with implementation.

Source	**Principle**	**Authors**
Distorted perception	Myopia, or inability of the company to consider the future with clarity. Denial or refusal to accept any information that is not anticipated or wanted. The perpetuation of ideas, tendency to proceed with present feelings despite that the situation has changed.	Zeffane, 1996; Kruger, 1996; Rumlet, 1995; Barr et al., 1992
Low motivation for change	The direct cost of change. Cannibalization costs, changes that could lead to the project's success but may bring losses to others, so it requires some sacrifice. Bad experiences/history of failures. Different interest level among employees and management.	Waddell and Sohal, 1998; Rumlet, 1995
Lack of creative response	Fast and complex environmental changes, which do not allow a proper situation analysis. The reactive mind set, resignation or tendency to believe that obstacles are inevitable. Inadequate strategic vision or lack of clear commitment and willingness of top management to change.	Rumlet, 1995; Ansoff, 1990; Waddell and Sohal, 1998
Political and cultural deadlock	The negative relationship between implementation climate, change values and organisational values. Departmental politics. Strong and definitive disagreement among group members. Deep rooted values and emotional loyalty.	Nemeth, 1997; Klein and Sorra, 1996; Zeffane, 1996; Beer and Eisenstat, 1996; Rumlet, 1995
Other sources of resistance	Leadership indifference because of fear of status quo change. Internal routine. Collective action problems. Lack of necessary skills to implement change. Cynicism.	Reichers et al., 1997; Beer and Eisentat, 1996; Rumlet, 1995; Hannan and Freeman, 1984; Starbuck et al., 1978

Table 3: Sources of Resistance

1.2.2 Equity Implementation Model (EIM)

Among the methods that exist to evaluate resistance, Joshi (1991) proposed an equity implementation model. EIM is an equity-theory model that aims to understand users' resistance to change in the information systems field. It posits that individuals measure the change consequence of the new IT based on its net equity outcome. The net equity is estimated as the difference between changes in outcomes, (e.g., increase or decrease in the outcome, and changes in input, such as an increase or decrease in the input.) If the net equity is perceived, users will resist to change (see Table 4). Kim and Kankanhalli (2009) have also proposed a cost-benefit analysis of change in which switching costs play a central role in increasing/decreasing user resistance. In other words, the EIM's core proposition consists of the following:

1) individuals will evaluate each change attempt to assess whether it is favourable or unfavourable to them or their group;

2) change that is considered favourable does not cause resistance and may even be welcomed, whereas change attempts that are considered unfavourable are likely to be resisted;

3) change attempts that are perceived by individuals to be neutral lead them to maintatin a neutral behaviour toward it.

Inputs increase	**Outcomes increase**
- More work on data entry; - More tension; - Need of higher level skills to accomplish the job; - Effort required to learn how to use the new system.	- Pleasant working environment; - Less tension, more job satisfaction; - More opportunities for advancement; - Enhanced service to customers; - Personal recognition and better visibility; - Salary increase, job promotion.
Inputs decrease	**Outcomes decrease**
- Higher ease of usage; - Less effort; - Less time for information lookup; - Less cognitive effort.	- Loss of power; - Less bargaining power; - Job loss threat; - Higher exposure of individual failures.

Table 4[13]: Changes in Individuals' Inputs and Outcomes

[13] Table 4 is adapted from Joshi, K. (2005), "Understanding User Resistance and Acceptance during the Implementation of an Order Management System: A Case Study Using the Equity Implementation Model,", Journal of Information Technology Case and Application Research, Vol 7, N°1, p.9, and Vang TPS. (2008), "User Resistance to Information Technology: A Case Study of the Hmong American partnership", Doctoral Dissertation, Capella University.

Persons who are involved in a new system implementation expect to benefit from the positive results as much as the other parties participating in the process (Joshi, 1991). An individual is likely to compare the change in his/her relative outcomes with that of his/her employer. Joshi (1991) refers to this as the second level of analysis. However, if participants feel that their employer obtained greater relative gains compared to them, they are likely to become disturbed and see the change as unfavourable (Lauer et al., 2000). At the third level of analysis, Joshi (1991) argues that an individual is likely to compare his/her relative outcomes with that of other parties (e.g., other participants) within the organisation. S/he will evaluate whether the new system impacts him/her equally as others in the organisation. Otherwise, s/he will assess the change as unfavourable. These three levels of analysis (see Table 5) are developed within the equity implementation model to support the assumption that human beings behave rationally in their best interests (Joshi, 2005).

Level	**Principle**	**Criteria**
1	Change in equity status of the individual.	Net change in equity status = change in outcomes – change in inputs.
2	Comparison with the employer.	Relative outcomes of the individual vs relative benefits of the employer.
3	Comparison with the other individuals in the firm.	Relative outcomes of the individual vs relative benefits of the other persons working in the company.

Table 5[14]: Equity Implementation Model: Three Levels of Analysis

1.2.3 Resistance Orientations

Introducing a new technology in organisations often requires multi-levels of business process change. It also involves changes as of how individuals should carry out their daily jobs. This change may be minor (simple modification in the user interface or new application development), but it may also be as complicated as implementing a complete enterprise system, for instance, an ERP, regardless of the nature or size of the new system (Bou Saba and Meissonier, 2016). As stated above, individuals' responses can range from partial to complete acceptance of the changes, to a complete rejection of the new system, which in many cases can

[14] Table 5 is adapted from Joshi, K. (2005), "Understanding User Resistance and Acceptance during the Implementation of an Order Management System: A Case Study Using the Equity Implementation Model,", Journal of Information Technology Case and Application Research, Vol 7, N°1, p.8, and Vang TPS. (2008), "User Resistance to Information Technology: A Case Study of the Hmong American partnership", Doctoral Dissertation, Capella University.

lead to project failure (Nov and Ye, 2009). Kling (1980) argues that resistance can be observed from three perspectives: people-oriented, system-oriented, and interaction-oriented (see Table 6). These are detailed below.

Name	Principle
People oriented	Resistance occurs because of backgrounds, traits, and attitudes toward technology.
System oriented	Resistance occurs because of technology-related factors such as user interface, security, ease of use, performance and centralisation degree.
Interaction oriented	Perceived social losses because of changing power relationships between employees, social and job structure.

Table 6: Resistance Orientations

1. People Oriented Resistance

Both internal and external factors can directly impact the individual's level of interaction with the new IT and therefore IT usage (Martinko et al., 1996). For instance, if individuals have positive expectancies, they would be more likely to encourage acceptance (Norzaidi et al., 2008). On the contrary, if individuals have negative expectancies, they would be more likely to resist to the new IT. At the individual level, resistance is often psychological, requiring a unique and personalised strategy from implementers to minimise resistance (Markus, 1983). On the other hand, Lapointe and Rivard (2005) posit that groups are more likely to resist to change and therefore resistance behaviours are higher in groups than in individuals separately. Markus (1983) also adds that on the group level, resistance is often socio-political oriented. Additionally, people-oriented resistance includes the necessary skills that an individual must acquire to adapt to the changes caused by the new IT (Besson and Rowe, 2001; Jiang et al., 2000; Markus, 1983). Furthermore, variations in the job description have been shown to augment resistance toward new technologies in organisations (Jian et al., 2000). However, Henry (1994) argues that special training programs and sessions are essential to minimise resistance and engage individuals in the implementation process as active participants of change. Training could lead to a reduction of negative attitudes and anxiety according to the same author. Resistance may also be *"cognitively distanced resistance"* through cynicism, a negative behaviour toward technology (Selander and Henfridsson, 2012). Numerous social factors cause human resistance including relational factors, non-relational factors, political factors, and management factors (Waddell and Sohal, 1988) (see Table 7).

Factors	Principle	Authors
Rational	An individual's rational assessment of the outcomes is not the same as the management's.	Ansoff, 1988; Grusky and Miller, 1970
Non-rational	The assessment of change is irrational, biased by personal preferences.	McNurry, 1973; Kaufman, 1971; Judson, 1966
Political	Political point-scoring and favouritism against those initiating the change.	Ansoff, 1988; Blau, 1970; Grusky and Miller, 1970
Management	Poor or inadequate management style by managers in charge of the implementation.	Judson, 1966

Table 7: Social Factors of Resistance

The IS literature on people-oriented resistance also posits that a successful technology implementation requires specific personality factors of participants as well as an excellent line of communication, which should be clear, explicit in definitions and expectations from the group of individuals involved in the project (Pieterse et al., 2012). For instance, participants' age was stated to be a factor impacting IT implementation as young individuals seem to be more accommodating with changes and more flexible than participants from other age groups (Fuerst and Cheney, 1982). Another factor is the participants' educational level, as educated individuals show more willingness to accept and utilise new IT systems than less educated participants (Fuerst and Cheney, 1982). According to Dickson and Wetherbe (1985), the perceived need impacts IT implementation, because the likelihood of IT acceptance is increased if participants perceive a real need for using a new IT. Finally, if individuals feel that new IT will contribute to their work performance and improve productivity, they are more likely to adopt the new system (Zmud, 1979). Zmud (1979) calls this factor the degree of IT expected use. Finally, Samuelson and Zeckhauser (1988) propose a status quo theory, which explains individuals' preference for maintaining their current situation or existing situation.

2. System Oriented Resistance

System oriented approach posits that resistance is induced by external factors inherent in the design and the introduction of the new technology (user interface, technical ease of use, security, etc.) (Markus, 1983). If a system reacts slowly and has data quality issues, it can rapidly generate negative attitudes toward it, and can lead to lower usability (Dickson and Wetherbe, 1985, Markus, 1983). After implementation, if the new technology has a poor technical quality, individuals will avoid it. However, if the new system seems to improve task performance or decision quality, then they are more likely to use the IT (Lapointe and Rivard,

2005). On the other hand, during IS design, if the intended users are not involved in the design process, the project could risk a disparity between the original objectives of the system and the users' real needs (Ives and Olson, 1984). Moreover, users' non-involvement in the IS design process seemed responsible of the separation between developers that are mostly concerned with the technical aspects of the system, and users who are mainly interested in its impact on their jobs (Ives and Olson, 1984). To conclude, Tzeng (2011) argues that users' resistance depends on their practical experience and interaction with the new system. In other words, experience-based perceptions give clear clues for individuals to decide whether to use the new system or not (Venkatesh and Davis, 2000, 1996).

3. Interaction Oriented Resistance

Interaction-oriented approach analyses the interaction between the individual and the new technology. It assumes that technology acquires different political and social meaning under different settings, while different individuals perceive the effect of the same system differently (Joshi, 1991). In the interaction-oriented approach, IT takes various political and social meanings of different settings, and individuals perceive the effect, each in a different manner (Jiang et al., 2000). Moreover, the interaction-oriented approach posits that perceived social losses are caused because of the interaction between individuals and the technology, such as changing power relationship, social structure, and job structure (Markus, 1983). IT implementation induces changes in resources distributed across the firm (e.g., modifications to departmental budget allocations, equipment, HR and staff, individual authority, status, job position or salary) (Hirschhiem and Newman, 1988). For instance, new IT systems can distribute more power to the main individuals by allowing them to access real time data (Davenport, 1998). On the other hand, IT can increase user resistance because of the reduced autonomy of some employees (Lapointe and Rivard, 2007, 2005), which may cause a negative feeling of power loss. Social influence and more precisely conformity is defined as a change in belief or behaviour in response to real or imagined social pressure (Cialdini and Goldstein, 2004). It is also known as majority influence. Social influence was studied by Eckhardt et al. (2009) who argued that there is a significant impact on IT adoption from workplace experiences. The authors state that individuals are averse to uncertainty, which in turn causes negative psychological reactions in their decision-making process. Furthermore, social influence pushes individuals toward the status quo (Kim and Kankanhalli, 2009; Brown and Venkatesh, 2005). On the other hand, Jiang et al. (2000) argue that the causes of user resistance usually differ

from system to system, but uncertainty and fear of change in job content are common causes of resistance.

1.2.4 Conclusion of the Acceptance and Resistance Literature

Acceptance and resistance are considered to be opposite ends of a single dimension (Lapointe and Rivard, 2005; Jiang et al., 2000; Martinko et al., 1996). Most IS research theories and concepts have been focusing on either resistance (e.g., Kim and Kankanhalli, 2009; Joshi, 1991; Markus, 1983) or on acceptance (e.g., Venkatesh and Davis, 2000; Davis, 1989). For instance, Martinko et al. (1996) propose an attributional explanation for individual resistance (or acceptance of) IT. The most prominent theories underlying user acceptance research are the Theory of Reasoned Action (Ajzen and Fishbein, 1980) and the extended Theory of Planned Behaviour (Ajzen, 1985). Both are widely applied within the IS field and reveal intrapersonal factors in explaining behaviour (e.g., Technology Acceptance Model (TAM) of Davis (1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) of Venkatesh et al., (2003)). On the other hand, the most cited user resistance theories in the IS literature are the following: Interaction Theory (Markus, 1983), Equity Theory (Joshi, 1991) and the Multilevel Theory of Resistance to IT (Lapointe and Rivard, 2005). The Interaction Theory explained resistance in organisational settings (Markus, 1983). It argues that individuals or groups resist to systems because of an interaction between characteristics related to the persons and features related to the system (Markus, 1983, p. 431). Furthermore, the interaction theory has two variants:

(1) a sociotechnical variant that focuses on the distribution of organisational tasks across various roles and the work-related communication and coordination around this division of labour; (2) a political variant that raises the interesting view that wider contextual issues, such as the redistribution of power among stakeholders, may affect IS adoption (Markus, 1983).

The Equity Theory posits that individuals measure change consequence of the new IT based on its net equity outcome (Joshi, 1991). Lastly, Lapointe and Rivard (2005) explored five interacting resistance components in their Multilevel Theory of Resistance to IT, distributed as follows:

(1) initial conditions (pre-implementation context);

(2) the subject of resistance (the user or actor);

(3) the object of resistance (the IS);

(4) perceived threats (the possible negative consequences of the object for the subject);

(5) resistance behaviours.

According to the same authors, resistance may vary from apathy to aggressive resistance. They also argue that resistance behaviours can vary over time and, not dissimilarly to Markus (1983) and Joshi (1991), posit that resistance results from perceived threats rather than from the system itself. Van Offenbeek et al. (2013) however state that IS theoretical underpinnings have some divergences, as ambivalent user behaviours can be observed in daily life which also lead them to question a "bipolarity view." Accordingly, resistance and acceptance research streams tend to draw on distinctly different assumptions. According to Van Offenbeek et al. (2013), if acceptance and resistance had a common conceptual dimension, one would expect IS resistance and acceptance research to apply similar theories, attributes, and methods. Individuals may use technology while also resisting its consequences (Van Offenbeek et al., 2013). For example, sales people may rely heavily on their cars to perform business development activities and at the same time openly revolt against car-travelling very often and complain about the CO2 that cars emit, damaging the environment. The opposite occurs when people support a technology without feeling obliged to use it. For instance, certain business school professors may strongly advocate the importance and innovative potential of Massive Open Online Courses (MOOCs), but for various reasons, they do not use it themselves at their institutions. These observations are consonant with Knowles and Linn's (2004, p. 141) approach-avoidance model, which states that requests for adoption will meet multiple and usually conflicting motives. This raises the question as to whether acceptance and resistance can best be conceptualised as opposite ends of one dimension (bipolarity), or as two dimensions that may be largely independent (Van Offenbeek et al., 2013). Are non-acceptance and resistance conceptually equivalent? To the extent that they are not, the two concepts can also be functionally non-equivalent. For instance, Herzberg (1964) proposed the two-factor motivation-hygiene theory, suggesting that job satisfaction and dissatisfaction have different antecedents. Accordingly, conceptualising opposites into two separate constructs is not new (Van Offenbeek et al., 2013). Hence, user acceptance and resistance may have different antecedents and may impact different IS implementation outcomes, or impact the same outcome differently. Finally, Van Offenbeek et al. (2013) proposes a framework that distinguishes four groups of users: (1) supporting users; (2) resisting users; (3) resisting nonusers; and (4) supporting non-users. In their study, acceptance and resistance are conceptualised as unipolar and bipolar constructs. The authors also argue that the constructs of acceptance/non-acceptance and support/resistance are both expected to contribute to explaining adoption at the organisational level.

1.3 Conflicts Literature

While the IS literature discusses resistance or conflict without making clear differences between both concepts (Meissonier and Houzé, 2010), my analysis, both based on psychology and sociology theories, considers resistance as a behavioural dimension of conflict: the way, a person expresses a conflict. Referring to the IT Conflict-Resistance Theory (IT-CRT) (Meissonier and Houzé, 2010) and the Theory of Reasoned Action (Ajzen and Fishbein, 1980), I consider conflict as a form of attitudinal belief corresponding to an affective or evaluative judgement of an individual. For instance, the IT-CRT is based on both psychology and sociology theories. It puts forward some relationships between resistance and conflict, whereas IS literature separately develops related theories (Meissonier and Houzé, 2010). Simply contrasting and comparing both concepts would reinforce the "isolationist tendency". Accordingly, the authors proposed an integrative approach articulating resistance and conflict related to IT implementation as a comprehensive theoretic system. IT-CRT is summarised as follows:

- Acts of resistance shape how conflicts are expressed. In this sense, resistance is a behavioural dimension, whereas conflicts are indicative of the attitudinal beliefs toward the IT to-be-implemented;
- Conflict types related to IT are not exclusive and can overlap;
- Individuals may resist to IT by expressing only one part of the related conflicts;
- A challenge for managers is to adopt conflict management styles that enable them to identity the non-expressed parts of the conflicts.

The IS literature on conflicts is limited, although conflicts are an inherent part of organisations, and research on the subject in the organisational context is acknowledged and studied in many fields including psychology, sociology, organisational behaviour, and marketing. According to Boonstra and De Vries (2015), there is no systematic perspective on conflicts directly related to IS initiatives despite that the IS literature contains much research on power and resistance associated with IS projects providing a much understanding of the politics surrounding IT. This thesis aims to address that challenge by examining and categorising such conflicts in an IT implementation context. In doing so, I seek to promote a theoretical understanding while also helping practitioners to recognise IS conflict types in the belief that such an understanding will help them manage these issues but also tackle future ones.

1.3.1 Conflicts Background

Conflict is a disagreement of persons or group of individuals that perceive a situation as being incompatible with their interests (Robbins, 1974). Thomas defines conflict as: *"a process which begins when one party perceives that another has frustrated, or is about to frustrate, some concern of his"* (1992, p. 265). At the individual level, an employee may be opposed to himself, to other employees, groups of employees, or institutions (Thomas, 1992). Conflict can be "realistic" when the employee is frustrated by a specific unsatisfied demand. It can also be "unrealistic," when the employee has antagonist needs, and when the conflict turns out to be an end in itself. On the other hand, at the group level, conflicts could be task-oriented where issues arise between groups because of differences between the professional assignments that must be realised. Conflicts could be relational-oriented as well, where more individual disaffections occur between members of two or more groups, known as intra-group conflict, emitting negative emotions affecting team performance (Jehn and Bendersky, 2003). In other words, conflicts involve a perception of incompatibility causing negative emotions.

As such, conflicts include contextual (interdependence), cognitive (disagreement), behaviour (interference), and affective (negative emotion) components (Boonstra and de Vries, 2015). Lastly, at the inter-group level, beyond task-oriented asymmetries, socio-political oriented approaches such as ideologies, values, power tensions, etc., play a major role (Walton et al., 1969). Because of socio-political oriented misalignments, miscommunication becomes a parallel consequence to inter-group conflicts (Walton et al., 1969). Therefore, one could notice "affective" behaviours to such conflicts, distinguished by researchers in psychology in two ways: 1. intellectual – when employees focus on facts and ideas; and 2. emotional – when it is caused by feelings of jealousy, anger or frustration (Pinkley, 1990). In that case, engaging frequent contacts between employees or enhancing communication quality are observed as key factors to calm the conflict situation. Intra-group and inter-group conflicts may be associated with an IT deployment project, and therefore the literature analysis allows me to identify two main conflict categories: 1. Socio-political oriented conflicts; and 2. Task-oriented conflicts, divided on different forms: 1. Socio-political oriented - cultural conflicts or conflicts due to a loss of power; and 2. Task-oriented - conflicts about the system, the definition of the execution of tasks that users must fulfil or conflicts about the new professional skills required (Markus, 1983; Markus et al., 2000; Besson and Rowe, 2001).

Conflict types		Description	Authors
Task-oriented	Conflicts about the IT system	Conflicts about the design of the IT itself, including its functionalities. These conflicts are associated with the technology acceptance models.	Venkatesh, 2000; Davis et al., 1989
	Conflicts about the tasks that employees must fulfil	Conflicts caused by the way firms' processes must be changed or adapted to fit the new IT process requirements.	Besson and Rowe, 2001; Markus et al., 2000
	Conflicts about the new professional skills required	Conflicts caused by the need for new professional skills to use the new IT.	Newman and Westrup, 2005; Besson and Rowe, 2001; Markus et al., 2000a, b
Socio-political oriented	Conflicts due to cultural principles	Psychologically-based conflicts referring to employees' ideologies by which they share beliefs and make sense of their words.	Stewart and Gosain, 2006; Beyer and Trice, 1993
	Conflicts due to power loss	Conflicts associated with the way how hierarchical authorities and management are likely to be reformed after IT implementation.	Avgerou and McGrath, 2007; Besson and Rowe, 2001; Davis et al., 1989; Markus, 1983

Table 8: Archetypes of Conflicts

1.3.2 IS Conflicts Types

IS-related conflicts gather intra- and inter-department levels and mix several dimensions (Meissonier and Houzé, 2010). This thesis identifies five different conflict types based on the present literature analysis in IS, which are presented as functions of their task vs socio-political orientation.

- Conflicts about the IT system

Conflicts about the system are about IT design, including its technical characteristics, functionalities and technical efficiency. Such conflicts can be assimilated with prominent technology acceptance models (Venkatesh, 2000; Davis et al., 1992, 1989). Accordingly, such conflicts recall acceptance models and more specifically the “perceived ease of use” dimension as well as the attitude of employees to use a new technology. Furthermore, prior empirical research has provided extensive observations on personal characteristics, such as readiness to change (Walczuch et al., 2007), personal competencies and organisational commitment (Kwahk and Lee, 2008).

- Conflicts about the tasks that employees must fulfil

As organisational processes must be adapted or changed to fit with new IT process requirements (e.g., daily reports on activities instead of weekly reports, how business proposals

must be established, when business fees should be declared), task-related conflicts on the definition of the task and its execution occur. Besson and Rowe (2001) argues that conflicts can be initiated internally by employees, when they compare the way they accomplish their tasks, perceive modus operandi and operational definitions. Markus et al. (2000a, 2000b) and Lim et al. (2005) add that conflicts may also be initiated externally because of the process constraints imposed by the new IT. Best practices are imposed on employees without giving much consideration to their organisational specificities (Davenport, 1998), which may lead to major conflict triggers.

- Conflicts about the new professional skills required

A new IT implementation may require employees to develop new professional skills to deal with the new system and to be qualified for job transformations involved by the implementation (Besson and Rowe, 2001). Bernard et al. (2004) argue that the accounting context is the most striking professional illustration of new-skills related conflicts. The authors add that enterprise IS systems such as ERPs, have dramatically changed the tasks of employees traditionally in charge of collecting, aggregating and synthesising a huge quantity of financial data. For instance, such applications in the field of accountancy have made these employees no more responsible for data collection but only of ex-post information interpretation delivering a recommendation to their managers (Bernard et al., 2004).

- Conflicts due to cultural principles

Culture-related conflicts are psychologically-based. They refer to when individuals or groups perceive the underlying strategic objectives of the new IT as inconsistent with their cultural principles (Leidner and Kayworth, 2006). For instance, IS literature has several empirical studies on culture-related conflicts in the health sector (Bhattacherjee and Hikmet, 2007; Besson, 1999). Accordingly, one of these studies posits that medical staff perceives ERP-triggered financial control as inconsistent with the fundamental principles of public health services (Besson, 1991). On a larger scale, and particularly with technologies such as ERP systems, such IT embed assumptions about organisational practices and impose specific, similar ways of communication through technology (Molla and Loukis, 2005). According to the authors, there is clear potential for a cultural clash when these do not fit the adopting culture's norms. Avison and Mataurent (2007) for example found that an ERP implementation in China was unsuccessful due to national cultural factors. Lastly, Wagner and Newell (2004)

argue that IT implementation can be problematic for organisational subcultures when the software design is based on "best practices."

- Conflicts due to power loss

IT implementation may also cause conflicts because of users' loss of power (Meissonier and Houzé, 2010). According to the authors, power-related conflicts occur after implementation, when employees' independence, autonomy, and influence capacity are likely to change or be redistributed. When such conflicts occur between managers, they are sometimes called leadership or governance conflicts (Besson and Rowe, 2001). For instance, a new IT can bring more power to key employees allowing them to use real time data access to functionalities (Davenport, 1998). Despite hierarchical monitoring supported by IT, power loss for employees may be caused by more interdependencies with colleagues (Meissonier and Houzé, 2010). Integrating processes associated with IT turns out to be a management of interdependencies (Rockart and Short, 1989) by which an actor becomes a prescriber for his/her work-colleagues. Consequently, the political perspective regarding power distribution misfit appears to be primarily applicable for cross-functional IS (Markus, 1983) like enterprise systems. However, this is not the case for all IT that are implemented. According to Abdul-Gader and Kozar (1995), computer-related powerlessness is the feeling that an employee may have that the computer is dominating him/her. This often occurs when individuals perceive that they do not have control over their work processes or outcomes, and that the IT system holds the control. Knowles and Linn (2004) argue in their avoidance theory that an individual may act in favour and against change at the same time. For example, a person may express a task-oriented conflict toward an IT and a socio-political conflict by perceiving some unfair threats, simultaneously (Meissonier and Houzé, 2010). Therefore, resistance turns out to be a complex behavioural process. Conflicts in firms are caused in large part because of value or power factors that originate outside the particular lateral relationship under investigation (Walton et al., 1969; Thompson, 1960). Accordingly, advocating system inconsistencies or organisational misalignment is probably a more comfortable resistance strategy than the one consisting of expressing underlying individual socio-political challenges (Meissonier and Houzé, 2010).

1.3.3 Conclusion of the Conflicts Literature

Conflict is a prominent organisational phenomenon which is prevalent but under-researched in the IS discipline (Boonstra and De Vries, 2015; Meissonier and Houzé, 2010).

During IS implementation, many individuals with different goals participate in the project under uncertain conditions which can easily lead to conflicts (Boonstra and De Vries, 2015). Boonstra and De Vries (2015) analysed eleven published cases that included rich descriptions of conflicts that arose during IT implementation. The authors investigated the contexts, processes, and topics of these conflicts. In characterising these conflict types in a framework, they proposed four archetypical conflict types that are classified using two underlying dimensions: cognitive versus affective, and direct versus indirect consequences. The resulting archetypical conflicts are: 1) IS implementation process conflicts; 2) IS task conflicts; 3) IS structure conflicts; and 4) IS value conflicts. Consequently, the same authors argued that IS conflicts types that arise are not solely based on the technical and functional characteristics of the IT, but also on the perceptions gained from actual interaction with the new technology in the specific organisational setting. New IT often impose control mechanisms and new power roles that are not always welcomed by the intended individuals (Boonstra and De Vries, 2015; Meissonier and Houzé, 2010). Boonstra and De Vries (2015) also showed that IS conflicts types can be characterised as combinations of archetypes, and that conflict types may change with time. However, existing conflict theories disregard the different kinds of confrontations that are characteristic during IT implementation, according to the same authors.

1.4 Path dependency and Institutional Isomorphism

A focus on a firm's history matters (Djelic and Quack, 2007). For instance, North (1991) posits that *"Institutions are the carriers of history. They incrementally evolve by connecting their past, today and future."* Teece et al. (1997) confirm this assumption stating that past events rarely stay in the past. According to the authors, a firm's history has an impact on strategic decision making and organisational errors. Nevertheless, firms' processes and human decisions are mostly affected by their pasts, but focusing only on the previous mistakes is a too general assumption (Teece et al., 1997). However, not all prior mistakes, decisions or actions lead a firm into a "dependent path". That said, it would be useful to briefly review the literature on the concept of "Path Dependency" as it might give us an insight on the impact of past experiences on future ones.

1.4.1 Path Dependency

Research in economics provided several definitions of path dependency (Sydow et al., 2009). However, no unified theory of path dependency exists as the concept is only used in

figurative ways (Kucukyazici, 2014). Nevertheless, almost all definitions of the concept posit that past actions, decisions or events have an impact on present and future ones (Kucukyazici, 2014). According to Kucukyazici (2014), path dependency is linked to other concepts in the field such as sustainable permanence and "lock-in". However, path dependency specifically deals with inefficiencies occurred in the past that "lock" organisations in old processes and stop them from creating new ideas (Bröring et al., 2008; Liebowitz and Margolis, 1995). Accordingly, through path dependence, one might anticipate the occurrence of potential future events, by looking at past ones, without necessarily predicting the firm's exact path (Kucukyazici, 2014). Positive evaluation from a successful path reinforces support learning through the same path (Kucukyazici, 2014). The reinforcement mechanisms are characterised by the reproduction of a given institutional pattern on the long term through "increasing returns" (Mahoney, 2000). Moreover, according to Kucukyazici (2014), *"with increasing returns, an institutional pattern - once adopted - delivers increasing benefits with its continued adoption, and thus over time it becomes more and more difficult to transform the pattern or select previously available options,even if these alternative options would have been more efficient."*

In other words, path dependence depends on the activation of the self-reinforcement process (Arthur, 1989). For instance, when decision makers have to decide between two competing systems, their final decision will not be made based on a strategical analysis – instead, one of the two systems will be chosen first and be increasingly adopted if it is being self-reinforced by positive feedbacks (Kucukyazici, 2014). From that point, the firm will not be able to shift to the other system even if the existing system stops providing positive reinforcement mechanisms. Schreyögg and Sydow (2011) posit that self-reinforcing mechanisms are developed based on four different effects: 1) Coordination effects; 2) Complementary effects; 3) Learning effects, and 4) Adaptive expectation effects. Table 9 below details these assumptions.

Effects	**Principle**	**Authors**
Coordination	Organisational rules guide and predict the behaviours of the actors. Costs decrease when coordination increases because one would adopt the rules knowing that other individuals would also follow them.	Kucukyazici, 2014; Schreyögg and Sydow, 2011
Complementary	Complementary effects or synergy, as a result of the interaction of independent and interconnected rules or activities. Combining interconnected activities, such as in economies of scope, would produce an additional excess: T (x + y)> T(x) + T(y).	Kucukyazici, 2014; Schreyögg and Sydow, 2011

Learning	Performance increases when an operation is frequently repeated. Hence, efficiency will be gained decreasing the possibility to switch to new learning ideas.	Kucukyazici, 2014; Schreyögg and Sydow, 2011
Adaptive expectation	Individuals' opinions and behaviours are assumed to change in response with the expectations of other persons, because of the need for social belonging to the "winning side." A product becomes more attractive as more and more individuals are increasingly prefering it. Accordingly, a dominant solution is likely to become more adopted because of this self-reinforcing mechanism.	Kucukyazici, 2014; Schreyögg and Sydow, 2011

Table 9: Effects Contributing to Self-Reinforcing Mechanisms

Figure 15 below illustrates the process of self-reinforcing mechanisms. According to Mahoney (2000), during Time 1, several options are available, and one should be selected between different paths. At this stage, it is not possible to predict the option that will be chosen. For instance, if path B is randomly selected over competing paths in Time 2, self-reinforcement mechanisms would be necessary during Time 3 through positive feedbacks for path B be purposefully reproduced over time.

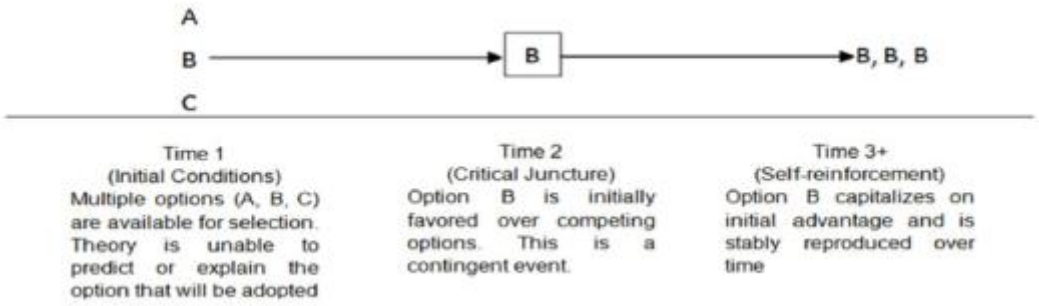


Figure 15: Self-Reinforcing Mechanisms (Mahoney, 2000: 5144)

Another cause of path dependence are lock-in mechanisms. To define these mechanisms, Sydow et al. (2009) state the following: *"at some point on the path, the set of options come to a critical juncture where the options narrow increasingly, and the outcomes become locked-into a certain path. There is no place for alternative options starting from that juncture"*. Consequently, firms would follow its dependent path even if there are better alternatives outside the path, which makes the system potentially inefficient (Kucukyazici, 2014). According to Arthur (1989), lock-in mechanisms become active because of four general properties, as seen in Table 10 below.

Property	Principle	Authors
Unpredictability	The outcomes become fully predictable after the critical juncture, unlike the beginning of the path, where outcomes are highly unpredictable.	Kucukyazici, 2014; Sydow et al., 2009
Non-ergodicity	Historical actions and random past events may cause lock-ins and therefore determine the outcome.	Kucukyazici, 2014; Sydow et al., 2009
Inflexibility	Actors become trapped, and it would be impossible to shift to alternative options.	Kucukyazici, 2014; Sydow et al., 2009
Inefficiency	Inflexibility causes inefficiency when individuals are locked in inefficient options, unable to shift to more efficient ones.	Kucukyazici, 2014; Sydow et al., 2009

Table 10: Properties Causing Lock-In Mechanisms

Sydow et al. (2009) developed a configuration model of what they call: *"organisational path dependence,"* that has three successive phases, as shown in Figure 16 below.

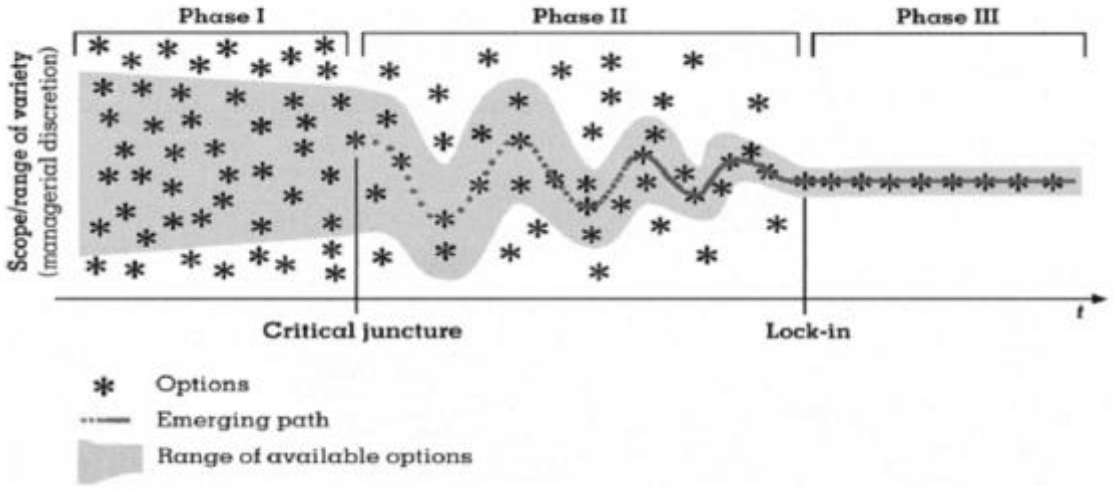


Figure 16: Organisational Path Dependence (Sydow et al., 2009, p. 692)

Phase 1 reflects the preformation phase, when the path outcome is unpredictable, because alternative options exist (Kucukyazici, 2014). Firms make decisions based on the self-reinforcement mechanisms. In this phase, the firm is capable of choosing, then testing many options until it receives positive feedback. When feedbacks are positive, *"options following the path of the decision are followed,"* according to Kucukyazici (2014). Consequently, critical juncture occurs when organisational path dependence becomes activated because of the self-reinforcing process, ending Phase 1. In the formation phase, Phase II, the decision processes are yet non-ergodic because choices are still available. Phase II ends when lock-in occurs. The last phase is called lock-in phase. According to Kucukyazici (2014), in Phase III, alternative options are no longer possible; and hence the system is potentially inefficient. Thus, the

outcome becomes predictable. The author adds the following: *"As a result of the lack of alternatives, further decisions have to replicate the path, so they are not even decisions anymore. Even the new individuals are forced to adopt this particular path and continue to reproduce this particular outcome".*

In the field of technology, path dependence reflects the influence that firm's historical events, even small ones, might have on the survival of technologies (Arthur, 1989). The core of the path dependency concept is that small historical events may eventually decide outcomes. It argues that a sub-optimal technology can become locked-in because of historical events (Davis, 2015). Empirical examples of this concept and technological lock-in include the QWERTY keyboard (David, 1985), VCR formats (Arthur 1990), chemical control of pests (Cowan et al., 1996), and nuclear power reactors (Cowan 1990). According to Davis (2015), these path-dependent technologies are arguably less performant than competing technologies, but were able to reproduce themselves until today, as a result of historical events that reinforced their leading position in the market. In the field of information systems, an example of path dependency, self-reinforcement, and lock-in, is when a firm has an ERP that lacks a needed functionality, and chooses a sub-optimal product to fulfil the need, instead of implementing the necessary changes to obtain it (Davis, 2015). Consequently, the firm is pushed to follow a particular path, while its existing ERP system is reinforcing its position.

On the other hand, lock-in mechanisms can also occur in behaviours (Davis, 2015). Barnes et al. (2004) call this state "behavioural lock-in," when a behaviour becomes locked in because of habits, learning or culture inhibiting its environment.

1.4.2 Institutional Isomorphism

While some general understandings posit that "history matters" when talking about path dependency, more accurate applications in organisational theory see the process as being a *"self-reinforcing with the potential for a lock-in."* (North, 1990). Strong relationships between organisational path dependency and institutional isomorphism exist because a lock-in is comparable to the situation of an institution which changes only incrementally at best (North, 1990).

The concept that might best account for the lock-in and self-path-reinforcement is the process of isomorphism. According to Hawley (1968), isomorphism is a constraining process that pushes a group of individuals in a population to resemble other groups that face similar environmental conditions. In other words, individuals that are working in similar environmental structures are likely to develop similar forms of actions. On an organisational

scale, isomorphism occurs as companies adapt their characteristics with their environments to increase compatibility (Aldrich, 1979). Institutional isomorphism posits that firms are influenced by normative pressures which arise from the government or state, competing firms, or even from inside the company (Zucker, 1987). Accordingly, operating procedures, legislative texts or ways-of-doing become pressure elements that lead businesses and make them seem "legitimate." According to Zucher (1987), adopting these legitimated elements leads to isomorphism and highly structured institutional arrangements with and within the institutional environment, and therefore increases a firm's chances of survival. As strategies are formed within these highly-structured settings, strategy-homogenization may result, due to three isomorphic processes present in these institutional arrangements: coercive isomorphism, mimetic isomorphism, and normative isomorphism (Zucher, 1987) as seen in Table 11 below.

Process	**Principle**	**Authors**
Coercive Isomorphism	When managers are required to respond to very powerful constituents made by other powerful actors upon which they depend.	Buchko, 2011; Tingling and Parent, 2002; Zucher, 1987; DiMaggio and Powell, 1983
Mimetic Isomorphism	When managers are overwhelmed by the turbulence, dynamism, and complexity of their environment, and decide to copy what other actors are doing hoping that they know what they are doing.	Buchko, 2011; Tingling and Parent, 2002; Zucher, 1987; DiMaggio and Powell, 1983
Normative Isomorphism	When norms for firm strategies and strategic behaviours are spread inside organisations - when managers are operating from similar frames of understanding, using similar analytical tools, and employing similar processes in the development of firm strategies. Thus, the strategies that results often bear a remarkable similarity to those of other organisations within the same environment.	Buchko, 2011; Tingling and Parent, 2002; Zucher, 1987; DiMaggio and Powell, 1983

Table 11: Organisational Isomorphic Processes

In the IS domain, an individual's beliefs about technology acceptance and use are driven by two major determinants: individual beliefs and social factors (Bozan et al., 2015). Accordingly, peers' influence is found to be a strong determinant of this belief. Bozan et al. (2015) developed a conceptual model combining a prominent technology acceptance model, the UTAUT, on the basis of institutional theory to better understand, how institutional forces and isomorphism processes, influence technology use behaviour. Like firms' isomorphic processes, an individual is driven by the motivation to comply. S/he develops beliefs in accordance with other persons perceived as important to him/her (Bozan et al., 2015).

1.5 Social Influence

In both user resistance and acceptance literatures, social influence seems to be an essential factor impacting individuals' IT adoption behaviours (Greenhalgh et al., 2009; Lapointe and Rivard, 2005; Venkatesh et al., 2003; Markus, 1983). For instance, Greenhalgh et al. (2009) posit that influence from the social environment has an impact on users' behaviors during ERP implementation.

According to Stangor (2004, p. 84), social influence is *"the process through which individuals or groups change the thoughts, feelings, and behaviour of others."* Social influence has three processes, namely compliance, identification, and internalisation, which impact individuals' attitudes and behaviours, and lead to behavioural changes (see Table 12).

Process	**Principle**	**Authors**
Identification	When an individual accepts influence from another person or group to establish or maintain a satisfying self-defining relationship to the other.	Forsyth, 2014; Sykes et al., 2009; Kelman, 2006
Internalization	When a person accepts influence from another to maintaining the congruence of actions and beliefs with his or her value system.	Kelman, 2006
Compliance	When an individual accepts influences from another person or group to achieve a favourable reaction.	Wang et al., 2013; Cialdini and Goldstein, 2004; Stangor, 2004

Table 12: Three Processes of Social Influence

Along with the three processes of social influence as described by Kelman (2006), social contagion is a similar concept that can be found in the literature of social science.

1.6 Contagion

The concept of contagion is extensively found in the social psychology literature, mainly incorporated through theories of social influence, social comparison, behavioural and emotional contagion (Barsade, 2002; Kelly and Barsade, 2001; Pugh, 2001; Marsden, 1998; Levy and Nail, 1993). The term "contagion" has its origins in biology and medicine and is extensively used to signify the spread of disease through touch or other forms of close contact among individuals. Though contagion has several definitions, empirical research confirms that human behaviour clusters in both space and time, even in the absence of coercion and rationale (Phillips, 1974). For instance, Hatfield et al. (1994) defined emotional contagion as a "*multiply determined family of psychophysiological, behavioural, and social phenomena."* The same authors focused in their work on primitive mimicry, which is *"the tendency to automatically*

mimic and synchronise facial expressions, vocalisations, postures and movements with those of another person, and consequently, to converge emotionally." Scholars in organisational behaviour also emphasised the role of social comparison (Parkinson, 2011). Additionally, Hareli and Rafaeli (2008) studied the role of emotional interpretation, which is using others' emotional displays as information, regardless of sharing their predicament. Finally, Barsade (2002) and Hatfield et al., (1994) focus on empathy or the influence of imagining another person's feelings.

Research on contagion can be broken down into three major areas:

(1) Social comparison which is the conscious comparison of one's feelings to the feelings of other persons who are in the same predicament (Parkinson, 2011; Barsade, 2002);

(2) Behavioural contagion (the spread of behaviours through individuals by simple exposure) - Behavioural contagion research can be broken down into seven broad areas, based on the nature of the behaviour that is spread; hysterical contagion, deliberate self-harm contagion, aggression contagion, rule-violation contagion, consumer-behavioural contagion, financial contagion and conflict contagion (see Table 15, p. 69);

(3) Research work exploring emotional contagion (experiencing or expressing another person's emotions, through emotional appraisals, subjective feelings, expressions, patterned behavioural processes, action tendencies).

1.6.1 Social Comparison

Research on social comparison has undergone several evolutions and modifications over the past five decades (Buunk and Gibbons, 2007). It has evolved from a fixed theoretical scope on self-evaluation by observing other individuals into a more complex and lively research scope using different experimental methods and purposes (Buunk and Gibbons, 2007). Nevertheless, the core of social comparison theory posits that self-evaluation is shaped by comparing oneself with other individuals (Festinger, 1954). In other words, humans compare their emotions with those of others in their environment and react in a way that seems appropriate in the situation (Sullins, 1991), where an individual anticipates another's emotional state and then experience him/herself. Individuals are thought to possess a fundamental motivation to compare themselves with others, which serves a variety of functions, such as fulfilling affiliation needs (Schachter, 1959), driven by a desire for self-evaluation (Festinger, 1954). Upward social comparison occurs when an individual compares him/herself with a superior other who shows positive characteristics, whereas downward social comparison arises when comparing oneself with an inferior other who shows negative characteristics (Wood,

1989). Research on upward social comparison has shown that humans tend to compare themselves to other humans who are perceived to perform better, providing support for Festinger's famous notion of "upward drive" (Buunk and Gibbons, 2007). However, a considerable body of research posits that individuals may react defensively if they are confronted with someone who outperforms them (Klein and Kunda, 1993). For instance, an individual chooses to compare himself with a superior counterpart labeling him as "genius" (Alicke et al., 1997) and distancing himself from him, when it appears to him/her that his/her counterpart is actually behaving better than that originally expected (Klein and Kunda, 1993). On the other hand, downward social comparison, which is considered as a major turn in social comparison theory (Buunk and Gibbons, 2007), posits that individuals who are "threatened" by failure on a specific dimension tend to socially compare with other individuals who are thought to be worse off on this very dimension (Buunk and Gibbons, 2007). According to Wills (1981), downward social comparison may occur under two different actions: active downward comparison, which involves "creating" a downward target by derogating, or making fun of, or even physically harming, another individual (Buunk and Gibbons, 2007); and passive downward comparison, which is reacting to information stating that another is worse off. Finally, because individuals can take their time to strategically conduct a self-social comparison that emphasises their most desirable traits (Gonzales and Hancock, 2011), emotional contagion is likely to occur. For instance, the convergence of emotions in groups has been proved through prior and extensive laboratory studies and initial evidence in social psychology (Barsade, 2002).

1.6.2 Emotional Contagion

While the role of emotions in social psychology is widely recognised, IS research has not yet focused much on the mechanisms through which emotional contagion occurs between individuals or groups of individuals during IT implementation. Research on social contagion has not only restricted itself to the spread of behaviours. A significant number of studies have identified a variety of emotional contagions as well. Emotions are intensity-varied feelings that arise because of a stimulus and get expressed in behaviours (Frijda, 1993). In psychology, emotion is often defined as a complex state of feeling that results in physical and psychological changes that influence thought and behaviour. Research in management science cites eight main basic emotions (see Table 13), of which four are positive, and four are negative (Tee, 2015; Haavisto and Sandberg, 2015). Human emotions are triggered by events, through personal evaluations, and therefore have a cognitive origin (Soscia, 2013). Emotions are

associated with a range of psychological phenomena including temperament, personality, mood, and motivation (Brebner, 2003). Positive social contagion enhances group coordination, decreases conflict, and increases perceived task performance (Barsade, 2002).

Form	Principle	Authors
Affection, contentment, happiness, pride	Positive events resulting feelings like love, sexual arousal, passion, peace, enthusiasm, and pride.	Tee, 2015; Haavisto and Sandberg, 2015; Laros and Steenkamp, 2005
Anger, fear, sadness, shame	Negative events causing angriness, frustration, humiliation, jealousy, nervousness, guilt, depression or irritation.	Haavisto and Sandberg, 2015; Soscia, 2013; Funches, 2011

Table 13: Basic Human Emotions

In the organisational behaviour literature, Humphrey et al. (2016) suggest that emotions are present in the workplace. Firms' employees may experience emotions outside their work environment and bring them to the workplace. Additionally, leaders (emitters of emotions) at work, as well as followers (receivers of emotions), can trigger emotional stimuli. Furthermore, emotional stimuli that occur in the office are generated through personal memories, which trigger emotions. The same authors state that emotions must be dealt with, either through self-regulation or emotional labour, because they may "infect" other employees. Leaders at work, are susceptible to these same events and can influence the emotions and moods of their followers, both positively and negatively. On the other hand, Tee (2015) argues that researchers in psychology should differentiate the primitive, tacit, implicit emotional contagion processes, driven primarily by the subconscious, automatic motor mimicry, from the more explicit processes which can be regulated by human interactions. This is consistent with the assumption that emotions can transcend formal organisational structures and hierarchies (Hareli and Rafaeli, 2008) through the model of "emotion cycles" within organisations (Dasborough et al., 2009), and the multi-level model of negative emotional contagion effects in organisations.

Contagion level	Principle	Authors
Level 1: Within-persons	Emotional contagion relies on two-key underlying mechanisms, mimicry, and synchrony, as well as, emotional experience and feedback.	Tee, 2015; Arizmendi, 201; Chartrand and Bargh, 1999; Dimberg, 1982; Trout and Rosenfeld, 1980
Level 2: Between-persons	Individual differences moderate the extent to which individuals are receptive of, positive and negative affect, leading to differing levels of susceptibility to contagion.	Tee, 2015; Eid and Diener, 1999; Bolger and Schilling, 1991; Watson and Clark, 1984
Level 3: Leaders to followers	Leaders' mood can influence followers' mood through contagion processes - mood contagion processes occur in two stages, starting from moods	Tee, 2015; Sy and Choi, 2013; Bass, 1985

	triggered by leaders, which are then transferred to, and propagated among followers at the group level.	
Level 4: Groups and teams	The spread of emotions in groups through a "ripple effect." Emotional contagion processes impact the overall team cooperation and conflict tendencies. Recurring emotional contagion processes ledd to a convergence of emotions between multiple individuals.	Tee, 2015; Barsade, 2002; Kelly and Barsade, 2001; Totterdell, 2000
Level 5: Organisations	In large organisations, the spread of emotions is likened to infectious diseases, influencing the experience of a vast number of individuals.	Tee, 2015; Dasborough et al., 2009; Ashkanasy and Nicholson, 2003

Table 14: Research Work on the Multi-Level Emotional Contagion in Organisations

As precised in Table 14, the concept of contagion is richly found in the social psychology literature, mainly incorporated through the phenomenon of emotional contagion (Barsade, 2002; Kelly and Barsade, 2001). The latter occurs when individuals seem to catch the "mood" of those around them, experiencing or expressing another person's emotions, through emotional appraisals, subjective feelings, expressions, patterned behavioural processes, and action tendencies (Sullins, 1991). Emotional contagion is a pervasive and important phenomenon occurring between individuals and groups (Jehn et al., 2013). However, little is known about the mechanisms behind the affective states of contagion between individuals during IT implementation projects.

1.6.3 Behavioural Contagion

Behavioural contagion is a type of social influence (Wheeler's, 1996), associated with how individuals' perceptions, thoughts, feelings, and behaviours are affected by others (Levine and Russo, 1995). Before defining the concept, it is essential to note that Wheeler (1966) was deliberate in his use of the term "behavioural". Wheeler (1966), however, emphasised changes in overt behaviour that need not be accompanied by the spread of emotion, hence the term behavioural contagion.

Consider the following example of behavioural contagion. Suppose that an employee is thinking about complaining about the firm's ERP because he thinks his employer is indirectly monitoring him because of the system. His name is Mark. Mark knows he can openly complain and is motivated to do so, but does not do so, because he is afraid of the consequences. Later, however, Mark observes other colleagues complaining about the ERP. They are also arguing that the system is a mean for the top management to monitor the performance of employees, apparently without consequences. At this point, Mark decided to join the conversation and complain about the ERP. Accordingly, behavioural contagion can be conceptualised as follows. The observer (Mark) is in a state of internal (intrapersonal) conflict. Hence, the conflict arises

because the individual's overt behaviour is inconsistent with his or her private desires (Wheeler, 1966). In the example, Mark did not complain about the system at first because he feared the practical consequences of shedding light on his performance rate. The internal conflict might also exist if an individual considers a behaviour immoral or dishonourable. At this point, the individual observes another person or groups engaging in the behaviour in question. If the others' behaviour goes unpunished, then they have demonstrated that the situation is safe. Moreover, when other individuals engage in the behaviour, they consider it to be legitimate or at least justifiable. Having witnessed the model or initiator, the observer's internal restraints and conflicts are reduced. The observer then engages in the behaviour, thus ending up in a state of internal harmony-the observer's overt behaviour is now consistent with his or her private desires (see Figure 17).

Area	**Principle**	**Authors**
Hysterical contagion	The spread by contact with symptoms and experiences usually associated with clinical hysteria (hallucinations, nausea, vomiting, fainting, etc.) in the absence of a biological contagion.	Pfefferbaum and Pfefferbaum, 1998; Houran and Lange, 1996; Colligan and Murphy, 1982; Kerckhoff and Back, 1968
Deliberate self-harm (DSH) contagion	Suicide is the paradigmatic example - suicide rates and other examples of DSH vary proportionally to the extensity, intensity, and content of exposure.	Higgins and Range, 1996; Gould, 1990; Phillips, 1974
Aggression contagion	Aggression transfer between transitory and unpredictable angry individuals or crowds, where media exposure has an impact on infection rates.	Goethals and Perlstein, 1978; Wheeler and Caggiula, 1966
Rule-violation contagion	Rule violation contagions have been identified in teenage smoking, speeding, substance abuse, delinquency, youth sex, and criminality.	Jones and Jones, 1995; Connolly and Aberg, 1993; Rodgers and Rowe, 1993
Consumer-behavioural contagion	The spread of consumer fashions and fads through populations in a manner more indicative of an influenza epidemic than rational behaviour.	Bass et al., 1990
Financial contagion	The behaviour of stock markets which lurch from state to state as a result of selling panics and buying frenzies that sweep across the globe.	Lux, 1998; Temzelides, 1997; Orlean, 1992
Conflict contagion	Conflicts transmitted to other individuals, groups, or countries, through behavioural actions, leading others to behave in a conflictual manner.	Bou Saba and Meissonier, 2016; Jehn et al., 2013; Philips and Loyd, 2006; Yang and Mossholder, 2004

Table 15: Contagion Research Areas

Wheeler (1966) argues that contagion could be conceptualised in another way regarding an approach-avoidance conflict. At first, the observer's avoidance tendencies are somewhat stronger than his or her approach tendencies. Other individuals' behaviour, however, reduces or disinhibits the strength of the avoidance tendencies, therefore reducing the observer's conflict.

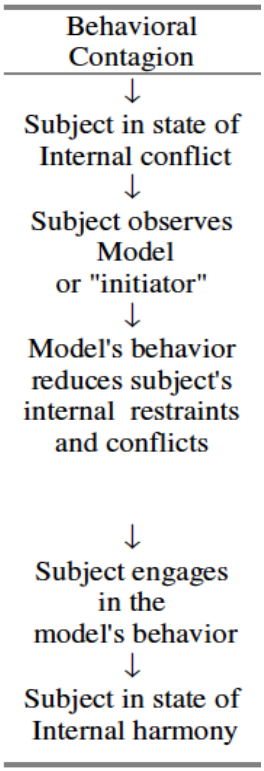


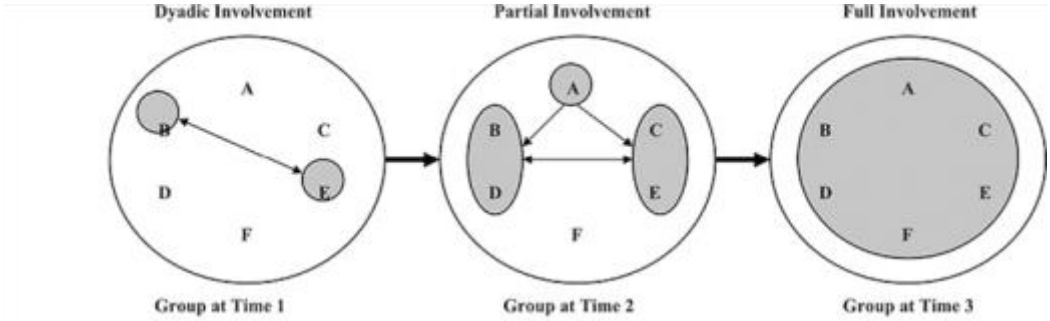
Figure 17: Wheeler's (1966) Process of Behavioural Contagion

Nevertheless, the observation of an individual (model) will not always result in contagion (Wheeler, 1966). Contagion is most probable *"when the avoidance tendencies are just slightly higher than the approach tendencies. If restraints are too great, observation of a model will not reduce them enough to change behaviour; if restraints are too weak, the observer will express his [or her] impulse regardless of what the model does"* (Wheeler et al., 1978, p. 53). Even though empirical research on contagion entails behaviours that are socially negative or undesirable, contagion can also occur with more positive behaviours (Wheeler et al., 1978). For example, during a brainstorming session, employees may hesitate to say out loud their ideas first because they are afraid to look ridiculous in front of their colleagues and managers. At this point, another employee says an idea and those who were reluctant quickly follow.

1.6.4 Conflict Contagion

While understanding how individuals or groups may develop conflict behaviours and resistance to change, one also must take into account conflict contagion, that occurs in or between groups (Jehn et al., 2013). In this research, I look at how interpersonal, or dyadic, conflicts may unfold in or between groups. By understanding the occurrence and spread of these conflicts, we may gain a more multifaceted knowledge of conflicts caused by IT deployment in groups. I draw from the literatures in psychology on intra-group conflicts (De Dreu and Weingart, 2003), group composition and coalition formation (Li and Hambrick, 2005), and emotional contagion (Barsade, 2002), to describe the evolution of a conflict in and teams over time, from involving just a few members to drawing in the firm. While many frameworks of conflict behaviours exist, they comprise actions as engaging in process control, forcing, confronting, accommodating, compromising, problem-solving, and avoiding (Meissonier and Houzé, 2010). However, because conflict perceptions are transmitted to other group members through behavioural actions (Jehn et al., 2013), such behaviours may also lead other individuals to behave in a conflictual manner (Jehn et al., 2013). According to the same authors, when conflicts take sides, tensions begin to flare between groups.

Jehn et al. (2013) discuss the evolution of conflict contagion in groups, starting from dyadic low-level conflicts where only a few individuals (group members) are actively involved in the conflict, to high-level intra-team conflicts with uniformly high conflict involvement, where all group members shift to be actively involved in the conflict (see Figure 18).



Mechanisms for Conflict Contagion		Coalition Formation Emotional Contagion Threats to Outcomes		Coalition Formation Emotional Contagion Threats to Outcomes	
Conflict Dynamics					
Resolution Potential	High		Low		Moderate
Competitive Tactics	Moderate		High		Moderate
Outcomes					
Performance	High		Moderate		Low
Efficiency	High		Low		Low
Creativity	High		Moderate		Low
Turnover	Low		Moderate		High
Satisfaction	Moderate		Low		Low

Figure 18: The Process of Conflict Contagion (Jehn et al., 2013)

Jehn et al. (2013) developed this theoretical model of conflict contagion to shed light on the contagion mechanisms inside teams, which they call "intra-team conflict involvement." According to the authors, intra-team conflict involvement refers to *"the number of team members behaviourally engaged in a conflict in their team. A team would have low intra-team conflict involvement when only a few members of the team are behaviourally involved in the conflict, whereas a team would have high intra-team conflict involvement if all team members are behaviourally involved in the conflict."* (Jehn et al., 2013). The authors also posit that when conflict behaviours arise between several members of a group, other observing members will likely adopt this behaviour thinking that *"there is a great deal of emotional friction among members of this team"* (Jehn et al., 2013; Li and Hambrick, 2005, p. 803). Because conflict behaviour is a human's reaction to the perception of a conflict situation (Rubin, 1994; Deutsch, 1973), such behaviour could entail quavering voices, crying, yelling, slamming doors, withdrawal, stubbornly insisting on a certain point of view, threatening, or being condescending (Van de Van de Vliert et al., 1999). Consequently, manifesting any of these behaviours is likely to be an indicator of an individual's involvement. According to Jehn et al. (2013), this negative affect ultimately lowers the outcome of the group in terms of performance, efficiency, creativity and satisfaction. Because of the "infection" that spreads between members, it also affects the individuals who had tried to hold their distance from the conflict, and eventually causing these members to become behaviourally engaged in the conflict like their peers.

Interdependence is the common characteristic overriding all groups, which makes the contagion process more likely to occur (Langfred, 2007). Because of mutual dependence among group members, which is the core of "team" definition (Hackman, 1987; Lewin, 1948), a problem that affects a few individuals is likely to affect all team individuals over time. For instance, in the case of IT deployment, a conflict contagion process may serve to include "positive" individuals (individuals initially holding distance from the conflict) to engage in conflict behaviours toward the IT project. Moreover, the underlying mechanisms of contagion evolve with coalition formation and emotional contagion (Jehn et al., 2013). Coalition formation occurs when two or more individuals jointly act to impact the objectives of other persons or groups (Jehn et al., 2013). Coalition formation is fostered when demographic similarities exist inside groups, according to the same authors. Furthermore, research in psychology has shown that group members modify their behaviours to align with socially similar group members (Crano and Cooper, 1973). The behaviour to conform to socially similar individuals is indeed a robust finding in the social psychology literature (Phillips and Loyd,

2006) and includes conflict situations. Additionally, persons involved in the initial conflict may also proactively recruit other individuals to form coalitions (Smith, 1989). In addition to coalition formation, conflict behaviours lead to negative emotions. When conflicts arise, negative emotions are likely to occur, and "positive" individuals become behaviourally involved in the conflict through the process of emotional contagion (Greer and Jehn, 2007a; Barsade, 2002). The relationship between behavioural contagion and conflict involvement is supported by research in psychology that suggests that emotions may manifest themselves in actual behaviours (Morris and Keltner, 2000). Hence, behavioural contagion, in addition to coalition formation, is another mechanism by which intra-group conflicts lead initially uninvolved individuals to engage in a conflict behaviourally. For example, individuals having socio-political oriented conflicts and task-oriented conflicts (Lapointe and Rivard, 2005) related to an existing IT are likely to develop a conflict contagion effect, consciously or unconsciously, and spread conflict behaviours, to other individuals in the firm.

1.6.5 Relationship with Similar IS Concepts

Based on the previous sections, it can be concluded that social influence and contagion seems to be important mechanisms impacting individuals' adoption behaviours (Wang et al., 2013; Venkatesh et al., 2003). Antecedents of social influence are studied extensively (Kim and Kankanhalli, 2009; Sykes et al., 2009; Cialdini and Goldstein, 2004) in the information systems field in general, and through user acceptance as well as resistance models, in particular. Similarities between contagion and social norms, subjective norms, peer and superior's influence, social factors and external influences can be observed in IS-related theories such as: TRA (Ajzen and Fishbein, 1980), MPCU (Thompson et al., 1991), Combined TAM-TPB (Taylor and Todd, 1995), UTAUT (Venkatesh et al., 2003), Attribution Theory (Martinko et al., 1996), and Diffusion of Innovation Theory (DIT) (Rogers, 1995). Contagion mechanisms are also elaborated in the IS literature; compliance, identification, internalisation, social influence, and the status quo bias are found to affect individuals. For instance, contagion occurs through the direct transfer of information during interactions between adopters and non-adopters (Strang and Soule, 1998). Theoretically, the literature sees all prior adopters as messengers or sources of contagious influence (Greve, 1995). Thus, the sheer number of adoptions by actors within a given population of individuals drives subsequent adoption. Similarities can also be observed in Rogers' (2003) Diffusion of Innovation Theory. According to the same author, diffusion is the process of innovation delivery, such as new ideas, application, product, and technologies, through a specific channel between multiple individuals

of a same social system. According to the same theory, many exogenous factors impact the decision on the application of information technology innovation. Innovation diffusion is a significant success factor (Frambach and Schillewaert, 2002). Furthermore, when variable factors have been applied, the diffusion of innovation will be accelerated. These factors are 1) Individual factors, 2) Innovative factors, 3) Task factors, 4) Organisational factors, and 5) environmental factors (Ollila and Lyytinen, 2003; Rogers, 2003). Both organisational and environmental factors are dependent on psychological and external influence factors, consisting of the following elements: cultural values and beliefs concerning change, technological infrastructure maturity, community norms (obedience to norms) and funding (Ollila and Lyytinen, 2003). Lastly, DIT posits that *"diffusion is a very social process that involves interpersonal communication relationships"* (Rogers, 2003, p. 19). Therefore, interpersonal channels in organisations are more powerful to create or change strong attitudes held by an individual. In interpersonal channels, the communication may have a characteristic of homophily, or, "*the degree to which two or more individuals who interact are similar in certain attributes, such as beliefs, education, socioeconomic status, and the like"* (Rogers, 2003, p. 19). Other similarities between contagion and DIT can be found in the "Persuasion Stage." Uncertainty about the innovation coupled with "the social reinforcement" from other individuals (colleagues, peers, etc.) influence the individual's opinions and beliefs. Moreover, close individuals' subjective evaluations of the innovation that limits uncertainty about the innovation are more credible to the individual. During the "Confirmation Stage" of the DIT, the individual seeks support for his/her already-made decision. However, Rogers (2003, p. 189) states that *"the decision can be changed if the individual is exposed to conflicting messages about the innovation."*

To conclude, contagion is practically studied in several research streams including but not limited to biology, medicine, epidemiology, economics, social sciences, etc. However, contagion has moved beyond the biological scope of the human body and begun infecting human minds and behaviours. It has also impacted human beings' interaction modes and influence on others. "Contagion" has a proper and literal meaning that relates to body-to-body communication of diseases, requiring a medical intervention to heal those who are infected, and vaccinate those at risk. On a more metaphorical and figurative scale, and this time in the information systems field, one could consider contagion in social science in the same way than in medicine, and consider conflicts, resistance, rumours, over-interpretations of officious objectives, as a sort of social disease appealing a managerial intervention.

1.7 Inoculation Theory

The core of Inoculation theory is a medical metaphor (McGuire, 1964). In medical immunisation, weakened forms of viruses are injected into the blood. Through cell adaptation, the body then reacts to this injection protecting itself from future attacks from stronger versions of that virus (McGuire, 1964). Accordingly, the same way an individual's immune system can be vaccinated (inoculated) against viral attacks, human behaviours could also be inoculated against influential negative attacks. For example, an Inoculation message designed to discourage teen ecstasy drug-use might begin with a warning that peer pressure from their friends or drug dealers will strongly challenge their negative attitudes toward buying or consuming ecstasy pills. Following the forewarning, these teens receive a handful of potential counter arguments they might face from their peers (e.g., *"You will certainly hear others saying that Ecstasy gives you wings, and it is entirely safe"*), followed by refutations of these counterarguments (e.g., *"Actually, these pills are very harmful and could get you killed. Think about of those who love you, your family, your real friends… You don't need ecstasy to be happy."*).

1.7.1 Mechanisms of Inoculation Theory

Inoculation Theory posits that it is crucial for an individual to experience a threat to be inoculated against a subsequent attack. Thus, a threat towards a person's beliefs is at the heart of Inoculation Theory (Compton and Pfau, 2009). It is a key motivational element that causes individuals to defend their beliefs in a process called counter-arguing that strengthens attitudes and behaviours against influence by elaborating and strengthening the network of beliefs that support the attitude (Pfau, 1992). In addition to the threat, the second essential element of Inoculation messages is the refutational preemption. Pfau (1992) argues that refutational preemptions provide specific content that receivers may employ to strengthen attitudes against subsequent change. In this regard, refutational preemptions assist the Inoculation process by providing arguments that can be used to refute arguments presented in future attitudinal attacks. It also gives individuals practice at defending their beliefs through counter-arguing (Compton and Pfau, 2004). Figure 19 presents the two main stages of the process – an inoculation message and an attack message.

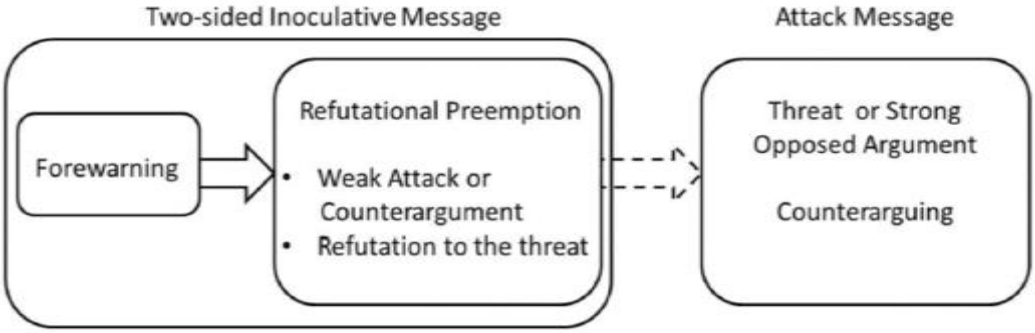


Figure 19: Inoculation Process (Wood, 2007; Pfau et al., 1997a)

An Inoculation message may be one-sided or two-sided. A one-sided Inoculation message consists only of the counterargument to the subject's belief. A two-sided message, however, provides both the counterargument and a refutation content to that argument – a specific message that receivers can use to strengthen their attitudes against attackers. According to Wood (2007), an effective inoculation message undergoes three steps (see Table 16).

Steps	**Description**
1 Forewarning (Threat)	The subjects receive a general introduction to the issue to activate defences in the form of a forewarning that makes them feel somewhat threatened.
2 Refutation	The subjects are provided with refutations to the threats that they can use to defend their positions.
3 Counterargument	The subjects receive a weakened attack which contains a strongly opposing argument and a personal consequence of the threat.

Table 16: Three Steps of the Inoculation Process

The Inoculation process, as well as the potential threats, are all based on the subjects' attitudes, which have received considerable attention in the fields of social sciences and social psychology (Eagly and Chaiken, 1993). Scholars of Inoculation Theory also studied the optimal amount of delay between Inoculation treatments and subsequent attitude attacks. McGuire (1964) argued that a delay was necessary between the Inoculation treatment and the attack message to provide the inoculated subject time to create arguments and defend his/her attitude. The author's assumption is theoretically consistent with the medical analogy as biological Inoculations require time for the human body to build up resistance. For instance, scholars have studied the impact of Inoculation messages right after administration (Nabi, 2003), after a few days (McGuire, 1966), or even weeks afterwards (Pfau and Burgoon, 1988). According to Wyer (1974), the subjects need time to engage in "cognitive reorganisation." They also need to rethink their position on the issue, self-establish arguments facing their

attitude, and develop as well as self-provide answers and arguments to refute future counterarguments.

On the other hand, Inoculation interventions have also been shown to enhance perceived issue involvement, improve attitude accessibility, strengthen perceived vested interest, and escalate communication about the issue with other individuals (Compton and Pfau, 2009). For example, Compton and Pfau (2004) enquired about whether an Inoculation treatment could lead college students to resist to credit card marketing efforts. The findings were that the inoculated individuals were less likely to communicate "positive things" about using a credit card, and were more likely to tell their peers "negative things" about it. However, the same authors later stated in another research study that it is still unclear whether inoculated individuals tend to communicate on both "positive and negative things" (Compton and Pfau, 2009), a mix of which is typical in Inoculation interventions (e.g., counter arguments and refutations). Table 17 below shows the relationship between Inoculation and attitudes.

Inoculation characteristics	**Description**	**Authors**
Threat	Following exposure to threat, inoculated individuals may go to their peers for reassurance, discussing the issue to restore confidence in the disturbing attitude, thereby reassuring themselves while also spreading Inoculation content among their social network.	Compton and Pfau, 2009; Step and Finucane, 2002
Issue involvement	Highly involving attitudes are more resistant to influence. Involvement may also play a role in rumour spreading as individuals talk about important matters with others who are important to them.	Compton and Pfau, 2009; Chung and Darke, 2006
Attitude accessibility	Attitude accessibility refers to how quickly one accesses an attitude from memory. The more accessible the attitude is, the more an individual will report thinking or talking about it.	Compton and Pfau, 2009; Wegener et al., 1995

Table 17: Inoculation and Attitude

Accordingly, Southwell and Yzer (2007) state that Inoculation extends beyond those directly affected by original treatment messages because it motivates continued "positive" contagion within individuals' environment as well. The same authors add that the transmitted "positive" messages between individuals on the Inoculation subject would be even more persuasive than the original Inoculation messages.

1.7.2 The Impact of Inoculation on Attitudes and Post-Inoculation Phase

Inoculation Theory posits that inoculating people through well-crafted messages make them resistant to "attacks" when needed (McGuire, 1964). Human attitude is a critical concept

that is deeply embedded in the model of Inoculation theory (Compton and Pfau, 2004). Attitude can be defined as having an opinion about a given situation or circumstance (e.g., behaviours, practices, religion, etc.) weighted by the personal behaviour and evaluation of the opinion (Ajzen, 1980). According to the ABC model of attitudes (LaPiere, 1934), attitudes structure can be defined in terms of three components. The first is the Affective component, which involves an individual's feelings/emotions about the attitude object (e.g., *"I am scared of not using the IT tool"*). The second component is behavioural, which reflects an individual's current or actions (e.g., *"I am using the IT tool/I will not use the IT tool"*). The third and last attitude component is Cognitive, which involves an individual's beliefs and knowledge about an attitude object (e.g., *"I believe that the IT tool will make me save precious time."*)

Individuals' original beliefs, Inoculation treatment, and threats are all based on the subjects' attitudes (Fagnot and Stanton, 2015). The concept of attitude has been studied in the field of social psychology, although it is a concept very well-known across the social sciences (Eagly and Chaiken, 1993). Inoculating individual's existing attitudes, humans can be the targets of carefully designed Inoculation treatments that maximise the strength of their current attitudes and make them refuse to embrace communicative messages that are attitudinally dissimilar (Breen and Matusitz, 2012). Research on resistance to attitude change investigated the strength of attitude as an essential element in resistance to change (Eagly and Kulesa, 1997). In other words, it is harder to change a strongly held attitude than a weakly held one (Fagnot and Stanton, 2015). For example, in an IT implementation project, the behavioural component might consist of not using/using the tool or attempts to find solutions for not using the IT tool, and convincing other individuals to do the same and to engage them in conflict. The affective component might consist of feeling threatened by the tool or happy of the advantages that the tool provides. The cognitive component might consist of thoughts about the tool, in terms of its impact and usefulness. A typical Inoculation message relies on three classic components: threat, counterarguments, and refutations (Compton and Pfau, 2009). Threat leads to generating counter arguments and refutations, which may be used to defend an individual's attitudes and illustrate attitude defence (McGuire, 1964). Accordingly, when Inoculation is performed based on these three components, it confers resistance, manifested by preserving attitudes in the face of persuasive attacks (Compton and Pfau, 2009).

The impact of post-Inoculation "positive" contagion between the subjects may vary with the source's trustworthiness in Inoculation messages transfer. For instance, the most credible transmitters are the colleagues and friends whose viewpoints are taken seriously (Huckfeldt and Sprague, 1995). However, research on source credibility in Inoculation is

relatively sparse (Compton and Pfau, 2005). Compton and Pfau (2009) however argue that Inoculation messages motivate continued "positive" contagion through daily conversations on the target issue, and even if the message moves from an untrustworthy (sterile) source, it will eventually land in the ears of a trustworthy source which will become a credible messenger of the message.

To conclude, in the post-Inoculation phase, Compton and Pfau (2009) argue that post-Inoculation conversations engage individuals in advocacy and confrontation through the following three effects:

1. The feeling of threat pushes the inoculated subjects to seek reassurance from their environment through post-Inoculation "positive" message transmission. Moreover, attitude strengthening effect of Inoculation motivates individuals to advocate for the now-bolstered opinion. The target attitude is thereby boosted because of the reassurance gained from peers;
2. Because of post-Inoculation conversations, the inoculated subjects gain more self-confidence to confront their peers that may hold opposing attitudes. It also enables faster and better counter-arguing;
3. Inoculation messages coming from credible sources in an individual's environment are more influential than those coming from "sterile" sources.

1.7.3 IS Change Management Strategies

The IS literature strongly argues that change is an inevitable consequence of IS implementation initiatives. In IT projects, change management (CM) techniques and processes are applied to assist managers in the deployment of an appropriate change action plan (Hornstein, 2008). For instance, change processes consist of socio-psychological methodologies that aim to support users' understanding during implementation (Hornstein, 2008). According to Hornstein (2014), for a project to succeed, an extensive human resource strategy is needed to engage the intended users in the implementation process and improve their skills. Generally speaking, different research threads exist that aim on minimising resistance, inducing readiness, and augmenting acceptance. More precisely, in the IT context, scholars have developed change implementation techniques for antecedents of IS acceptance (Capaldo and Rippa, 2009; Shang and Su, 2004; Joshi 1991). For instance, the literature on IS acceptance argues that it would be necessary to question the firm's capabilities before selecting which implementation strategy and change management technique should be used during IT implementation (Capaldo and Rippa, 2009). According to the same authors, change strategies

consists of top/management support, communication efforts, and training, among others. Joshi (1991) argues that users assess change regarding the expected outcome before deciding to resist or react in favour of the new system. Consequently, managers shall take into account the different expectations of their employees in their change management strategy. Accordingly, Expectancy Theory (Vroom, 1964) is based on four assumptions: 1) individuals join firms with expectations about their needs, motivations, and past experiences. Finally, Expectancy Theory consists of three key elements: 1) expectancy – motivation is proportional to the personal belief that effort will lead to good performance; 2) instrumentality – this performance will be rewarded by the firm; and 3) valence – the value of the reward is high (Vroom, 1964).

On the other hand, Ziemba and Obłąk (2015) provide in their article a summary of Critical Success Factors (CSF) for change management in IS projects (see Table 18[15]). They have based their literature analysis on both the change management literature and IS project management.

CSFs	**Definition**	**Authors**
Top management support	- Active and visible support from the management team; - Involvement and commitment of the senior management; - Direct participation of the strategic decision makers in the IS project.	Sutanto, 2008; Chrusciel and Field, 2006
Recognising the change	- The need for change has to be established; - Promoting a positive approach to change.	Graetz, 2000
Shared vision for change	- The vision should be strongly advocated across the organisation.	Cocks, 2014; Sutanto, 2008; Weber and Weber, 2001
Planning a project as a change	- Evaluating the gap between where the organisation is now and where it would like to be; - Managing the entire change process as a project; - Preparing a change management plan; - Promoting change in the organisation.	Cocks, 2014
Managerial activity	- Involving managers who are directly associated with the change process.	Chrusciel and Field, 2006
Effective communication	- Communicating the change message at all levels throughout the organisation.	Graetz, 2000; Kotter, 1995
Organisation's readiness to deal changes	- Organisations need to be ready to deal with change; - Employees need to feel that the organisation is willing to deal with change.	Weber and Weber, 2001

[15] Adapted from Ziemba and Obłąk (2015)

Employees' training	- Clear demonstration on how to use the IS.	Chrusciel and Field, 2006; Weber and Weber, 2001
Employees' involvement	- Employees' belief that the change is important and has an impact on the organisation's success.	Weber and Weber, 2001
Information flow	- Having readily available and current data gathered in one place and available to all interested.	Davenport et al., 2004
Performance measurement	- Measure of change performance and value it to employees to demonstrate success.	Greiling, 2005; Feurer and Chaharbaghi, 1995

Table 18: Critical Success Factors for Change Management in the IS Literature

For instance, successful change management techniques include a set of characteristics, conditions, and variables, which should constantly be sustained, maintained or managed to affect success factors of a firm competing in a specific industry (Ziemba and Obłąk, 2015; Leidecker and Bruno, 1984). Other authors such as Averweg and Erwin (1999), Graetz (2000), Guimaraes et al. (1992), Hotek and White (1999), Palvia and Chervany (1995), Rothwell and Kazanas (1998) and Weber and Weber (2001) have described CSFs for change management in projects in general, but only a few have established CSFs designed for IS projects specifically (Ziemba and Obłąk, 2015). On the other hand, Shang and Su (2004) argue that successful implementation depends on successful change strategies that can overcome resistance behaviours and induce readiness. For instance, a consistent behaviour research stream that tackles change and its acceptance in organisations is Self-Determination Theory (SDT) (Deci et al., 1989). According to Gagne and Deci (2005), SDT consists of investigating the impact of work environments that boost intrinsic motivation leading to enhanced outcomes. For example, organisational environments that encourage effective communication and training can lead to internalising the stated external motivations for IS implementation. An IS project's outcome depends on the change management strategies used by managers that have a positive influence in the workplace and that encourage change (Holt et al., 2007). For instance, IS implementation success induced by user satisfaction is achieved because of such change management (Venkatesh and Davis, 1996). Other IS acceptance streams include change techniques on how to prevent, reduce, or overcome user resistance (Folger and Skarlicki, 1999; Self and Schraeder, 2009); and on how to increase readiness for change (Self and Schraeder, 2009). Most of this research work consisted of strategies that create readiness or reduce resistance as a dependent variable.

Moreover, a few research studies have shown that individuals prefer collaborative resistance to change management methods instead of vertical-management methods imposed

by superiors (Robey and Taggart, 1981). Moreover, Meissonier and Houzé (2010) showed that adopting an "avoidance management style" by top managers, had no or insufficient impact on the success of the IT project. Project managers are likely to change their style several times during the project duration. Project managers might also change their change management style several times during the project duration (Meissonier and Houzé, 2010). However, the IS literature posits that managers should not remain passive to prevent negative diversions of projects (Leidner and Kayworth, 2006). On the other hand, the literature shows that in some cases, teams may work to resolve conflicts and resistance behaviours by themselves and proved to be suitable (Kankanhalli et al., 2006; Jehn and Mannix, 2001). To conclude, the IS research stream on change management techniques is very rich and consists of several contradicting techniques, as there is no "best way" to manage change.

1.8 Theoretical Discussion and Development

IT resistance may turn out to be in the light of the portfolio of past and present projects. By managing change in independent IT projects separately, with different teams and even with different methods, organisations may unconsciously lose sight on the way users' attitudes may be interrelated through conflict contagion mechanisms, involving cross-resistance effects.

Figure 20 hereafter presents the conceptual framework used in this research on identical conflict consequences occurring toward two different IT systems through conflict contagion mechanisms.

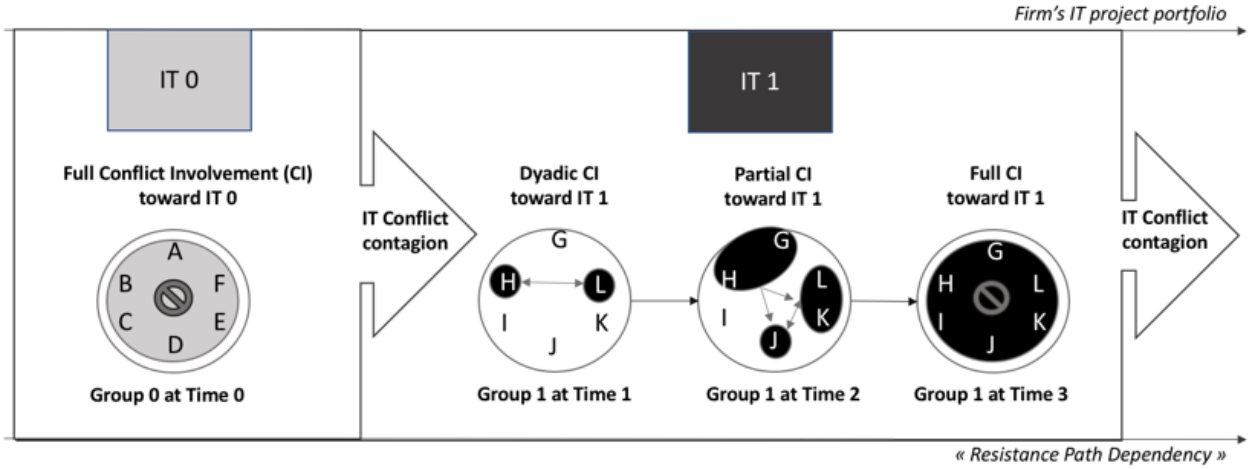


Figure 20: Conceptual Framework of IT Conflict Contagion Between Two different IT Systems

In the context of IT implementation projects, the IS literature is sparse on studying conflict contagion mechanisms occurring between two or more distinct IT projects. In my

thesis, I assume that resistance behaviours toward a past or present IT system (IT0) should be considered as one "infectious" disease that spreads and engages in the conflicts other individuals implementing a new IT system (IT1) with different objectives and characteristics. Consequently, IT1 would witness negative and resistance behaviours leading to implementation failure, or system non-use after implementation, because of conflict contagion mechanisms.

Negative experiences have been so far mainly observed between successive similar IT projects in terms of functionalities. I argue that a firm may be pushed to follow a very particular path, with its existing systems (IT tools already in place), reinforcing their "conflicting" positions. Moreover, I define "resistance path dependency" as a process in which an organisation faces the same resistance behaviours (conflicts) all along its path due to conflict contagion mechanisms occurring between individuals. In line with the research problems discussed in the Introduction part of my thesis (p. 13), I raise two research questions on this matter:

1.8.1 Research Question 1

What if an existing system in the firm is witnessing resistance behaviours – is it likely to impact the new to-be-implemented-system because of contagion phenomenon? Could conflict contagion occur between successive dissimilar IT projects (e.g., different IT tasks, users, objectives, etc.)?

1.8.2 Research Question 2

Do "negative" past, and present behaviours infect the "positive" behaviours of users engaged in a new project?

The concept that might best account for conflict contagion is the process of isomorphism. Hawley (1968) posits that isomorphism is a constraining process that pushes a group of individuals in a population to resemble other groups that face similar environmental situations. A conflict contagion process is most likely to occur because of interdependence between individuals (Langfred, 2000). Because mutual dependence among individuals is the core of organisational isomorphism and the institutional theory, and is crucial for group building (Hackman and Wageman, 2005), an issue that affects a few individuals is likely to affect other persons over time, because of coalition formation and behavioural contagion. Accordingly, I assume that individuals experiencing conflicts toward an existing IT system are

likely to develop a conflict contagion effect and spread conflict behaviours to other persons, but also to "positive" persons working on an entirely different IT project.

On the other hand, one may consider contagion in social science in the same way than in medicine and consider rumours, over-interpretations of officious objectives of separated projects, as a sort of social disease appealing a managerial intervention. The literature in psychology in general and Inoculation Theory in particular, posits that human behaviours could be inoculated against influential negative attacks (McGuire, 1964). Shang and Su (2004) argue that successful implementation depends on successful change strategies that can overcome resistance behaviours and induce readiness. Other IS acceptance streams include change techniques on how to prevent or reduce user resistance (Self and Schraeder, 2009); and how to increase readiness for change (Self and Schraeder, 2009). Most of this research work consisted of strategies that create readiness or reduce resistance as a dependent variable. On the other hand, Inoculation theory boasts an impressive body of empirical research testifying to its efficacy in conferring resistance to influence in different research contexts (e.g., marketing, health, politics). In other words, Inoculation appears as a technique that confers "resistance to resistance," or "fighting fire with fire," while the main IS change management research streams naturally tend to minimise and reduce user resistance. Accordingly, the theoretical framework developed in this thesis supports an alternative approach. It consists of fighting resistance with "resistance to influence" to resolve latent conflicts directly or indirectly related to the IS project.

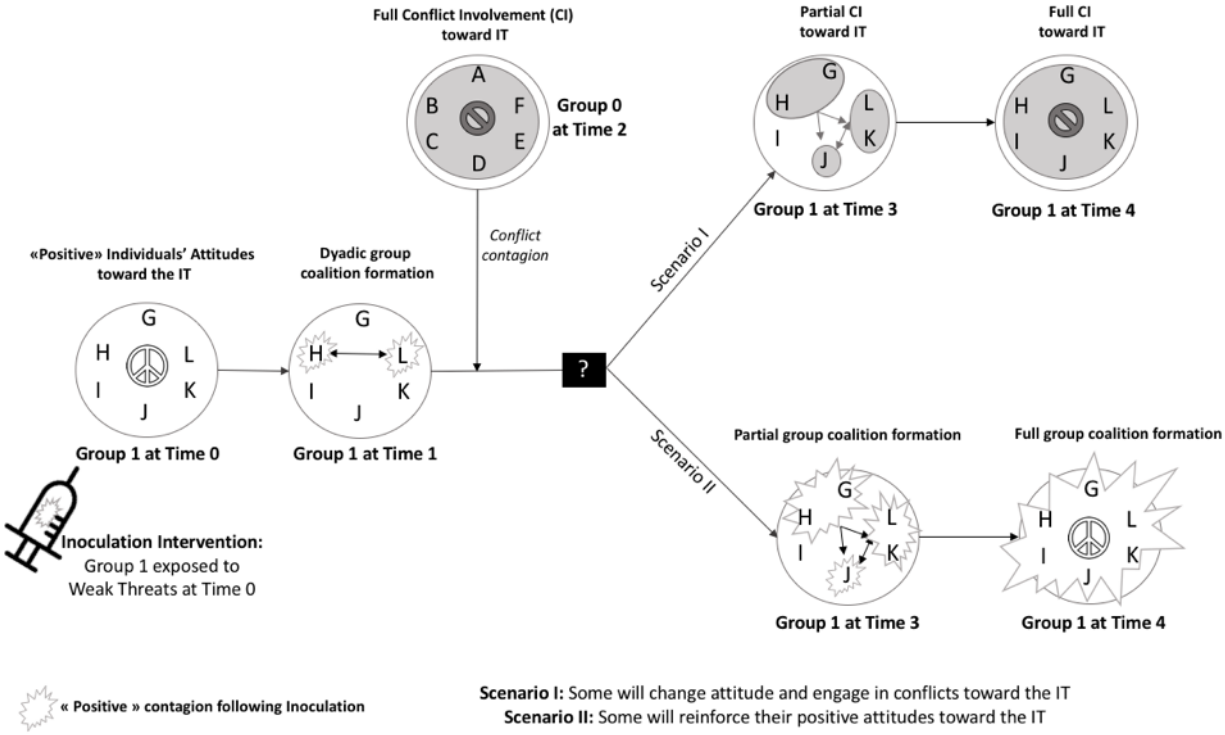


Figure 21: Conceptual Framework of Inoculation to Resistance to Attitude Change

Figure 21 illustrates the conceptual framework used in this research on Inoculation interventions. The framework presents the impact of an Inoculation intervention on "positive" individuals, after exposure to conflict contagion, in terms of Inoculation subjects' resistance to attitude change. The syringe is a metaphor for a vaccine containing weakened viruses (threats). Then, individuals belonging to Group 1 at Time 0 would receive the vaccine (inoculation intervention). At Time 1, a few individuals commence to interact with the vaccine but engage in "positive" contagion. At Time 2, Group 0 would tend to "infect" the inoculated individuals. Group 0 consists of individuals having full conflict involvement toward an IT system in the firm. The black box with a question mark represents the uncertainty as for what exactly happens when inoculated "positive" individuals from Group 1 are at risk of becoming "infected." In this research, "opening the black box" is important. Consequently, two opposing scenarios might occur: 1) some will change their attitude and engage in conflicts toward the IT, or 2) some will reinforce their positive attitudes toward the IT and their commitment to using the IT system. The second scenario shows how group coalition evolves through "positive" contagion.

Inoculation theory has very limited usages in the field of information technology implementation projects. Therefore, it would be interesting to see whether applying it in the IS field would succeed in bringing original contributions into the existing body of research on

change management techniques in IT-related projects. Then, a third research question is raised in line with the research problems discussed in Introduction (see p. 13):

1.8.3 Research Question 3

Could an Inoculation intervention during IT implementation reinforce "positive" individuals' resistance to attitude change?

On the other hand, it seemed reasonable that in IT implementation projects, some individuals would have attitudes opposed to the new IT system (Wood, 2007). Therefore, it would be interesting to see how "negative" individuals would react if they are exposed to Inoculation messages as well. In other words, it would be interesting to enquire about what happens, when intended IT users who actively dislike (i.e., have a "negative" attitude) the IT project, are exposed to Inoculation messages. For example, Wood (2007) hypothesised that an Inoculation intervention would induce a "boomerang effect" among individuals that initially hold a "negative" attitude. However, her findings were inconsistent with these hypotheses. Following the attack message, Inoculated participants with initially opposing attitudes witnessed a shift vis-à-vis the Inoculation-advocated position as their attitudes were slightly "directed" toward the desired position but maintained their opposing position toward the subject. Hence, in my case, I assume that individuals with "negative" attitudes would become less reluctant toward the subject and become less impacted by attack messages.

CHAPTER 2 - METHODOLOGY AND RESEARCH DESIGN

In a given study, research is based on one of the many underlying epistemological assumptions about what forms a "valid" research work, and which methodology would be the most suitable for knowledge creation. Hence, to justify the epistemological paradigm of my thesis, it would be essential to present the main academic assumptions and discuss the paradigm that was identified for my work. Additionally, the chapter details the research field (a management consulting firm called Efficient Innovation Corporation), the epistemological paradigm used (constructivist), research methodology (canonical action research), research design (the iterative research design of Susman and Evered, 1978), instruments (semi-structured interviews and informal conversational interviews, internal documentation, participant observations, etc.), data collection and data analysis techniques used.

Introduction	**Chapter 1 – Literature Review**	**Chapter 2 – Methodology & Research Design**
. Research problem: Limited IS studies on contagion mechanisms between distinct IT projects. . Research contract & field: CIFRE thesis at Efficient Innovation Corporation.	. User acceptance, resistance, conflicts, contagion, path dependence, and Inoculation. . Theoretical discussion and development: Two conceptual models of IT conflict contagion, and Inoculation.	. Methodology used to apply the conceptual models developed in Chapter 1: Canonical Action Research. . Research design used: Susman & Evered (1978) . Empirical field: A French management consulting firm called Efficient Innovation Corporation.

2.1 Case Description

2.1.1 Management Consulting Firms

Researchers in management science have been studying the sector of management consulting, among other sectors, through the lens of institutional theories and transaction costs (outsourcing, principal-agent issues, etc.) (Semadini, 2006). Furthermore, through the lens of organisational theories, previous research work on the subject have investigated the nature of consulting assignments that client firms undertake, the "added-value" generated for the clients, as well as the business process of consulting firms in terms of organisation and management (Srinivasan, 2014).

The management consulting industry is highly populated by organisations offering quite similar services while targeting different markets (David et al., 2013). According to the David et al. (2013), after the second world war, consulting firms tended to use external expertise to propose solutions to organisational issues. Today, some consulting firms tend to be aligned with their competitors, to avoid risky differentiated strategies, and therefore increase direct competition with their closest rivals (Semadini, 2006). Management consulting firms' core business highly depends on their "consultants" (Srinivasan, 2014). According to Fincham (2013), "consultants" are full-time exclusive human resources. The authors add that these employees have three essential roles: 1) providing support in management diagnosis and problem-solving; 2) delivering external points of views in dealing with management problems, and 3) intervening only on a temporary basis. According to Fincham et al. (2013, p. 6), *"any activity that has as its apparent justification the provision of some kind of support in identifying or dealing with management problems, provided by individuals, groups, or organisations that are external to the particular management domain and which are contracted by the management on a temporary basis"*.

Management consultants are specially trained individuals that provide professional advice to firms in an objective and independent manner (Greiner and Metzger, 1983). They have to identify organisational problems, analyse them, and assist in the implementation of managerial solutions. According to Turner (1982), there are eight pillars of consulting firms discussed hierarchically: 1) delivering critical information to the client; 2) solving the client's management issue; 3) developing a diagnosis through a redefinition of the issue; 4) establishing a plan of solutions based on the diagnosis; 5) helping with the implementation of solutions; 6) establishing a consensus around the solutions; 7) enhancing client learning to solve similar issues in the future; and lastly 8) constantly aiming for firm's effectiveness. The business

opportunity and value of management consulting firms is enriched due to their lack of diagnostic know-how and slow response time (Momani, 2013). Table 19 below classifies consulting firms into three groups based on the nature of their assignments (Srinivasan, 2014).

Group	**Description**
Procedural	Providing well-known solutions and methodologies. Success, however, depends on the efficient implementation of these solutions.
Brain	Providing solutions drawn from extensive creativity and professional expertise.
Grey Hair	Providing solutions based on accumulated experience in the field.

Table 19: Three Groups of Consulting Firms

According to Srinivasan (2014), each of the three consulting groups requires distinct resources, organisation, and methods. For example, "procedural-based" management consulting firms (those who employ well-known and established management methodologies) depend on a large base of codified knowledge. "Brain-based" (those who provide solutions based on creativity and expertise), and "grey-hair-based" firms (those provide solutions based on accumulated experience) thrive on a building a team of professionals that have significant expertise in the subject's issue (Srinivasan, 2014). First, consulting firms specialised in strategy and organisational restructuring leverage their tacit organisational knowledge to compete in the market. They are often required to intervene with the client for short to medium periods with limited solution implementation responsibilities (Srinivasan, 2014). Because both management consultants and clients have "expertise," the degree to which clients control the management consulting process is very high (Srinivasan, 2014). Malhotra and Morris (2009) add that consulting firms should maintain excellent relationships with their clients to obtain further assignments. The same authors present a typology of management consulting firms based on their specialisations, as shown in Table 20 below.

Specialisation	Basis of Differentiation	Temporal Involvement	Implementation Responsibilities	Extent of Client Control
Strategy and Organisational Restructuring	Tacit knowledge	Short to medium-term	Minimal involvement	Very high
Technology/Operations and Cost Control	Breadth of experience and expertise	Long term, throughout the assignment	Strong involvement in implementation of the advice	Moderate to high
Niche Consulting	Deep domain expertise	Long term, typically as retainers	Ownership of the implementation	Low

Table 20: A Typology of Management Consulting Firms (Srinivasan, 2014)

Second, consulting firms specialising in technology and operations and cost control, are hired because of the extensive technical know-how of their employees as well as their experience in finding solutions to such problems. Solutions must be implemented with the help of the consultants that provide training sessions to the client's staff. Third and last, niche consulting firms employ experts in particular industries and sectors in several innovation domains (Srinivasan, 2014). Consultants are involved with their clients on a long-term basis based on long-term contracts between on several projects, rather short contracts on punctual ones. These consulting firms provide the implementation methodology and the change management techniques to sustain implementation. Srinivasan (2014) argues that management consulting firms tend to create independent business units, hire graduated students of the top and relevant schools, establish a custom-made resource allocation process, evolve independent sales channels, develop new business models, and ensure commitment from top management.

To conclude, Scott-Kennel and von Batenburd (2012) posit that consulting firms' internal tacit knowledge is a capital importance and a key factor in maintaining activity and exponential growth. It is therefore essential for such organisations to manage their employees as a social and organisational capital through various configurations (Swart and Kinnie, 2013). Jensen et al. (2010) add that management consulting firms face significant conflicts in managing the procedures used for external demands, and internal investment in human capabilities (e.g., procedural, brain or grey hair) via an efficient deployment of specialised human assets. Srinivasan (2014) finally argues that client firms are indirectly better served when the internal tacit organisation of knowledge at consulting firms is adequately managed. According to the same author, efficient exploitation of organisational knowledge is crucial for developing and maintaining the balance between exploitation of existing knowledge and creation of new knowledge.

2.1.2 Efficient Innovation Corporation: A French Consulting Firm

Efficient Innovation Corporation (EI) is a French management consulting firm, founded in 1998, specialised in innovation management (European and national innovation projects setups, innovation marketing, innovation funding schemes, research tax credits, new product optimisation). EI belongs to the three groups of consulting firms (Srinivasan, 2014) concerning the different consulting services it provides (see Table 19 and Table 21). For instance, "funding" and "project management" services at EI refer to the "procedural" group, whereas "consulting" services refer to both grey hair and brain groups depending on the assignment's complexity. Additionally, EI's typology in terms of specialisation relates to both "strategy and organisational restructuring," and "technology/operations and cost control" (see Table 20). More specifically, the firm's basis of differentiation and temporal involvement also depend on the service provided. For example, "consulting" and "funding" services rely on tacit knowledge requiring short to medium-term involvement, whereas the "project management" service rely on extensive expertise requiring a strong involvement during implementation.

EI is an SME (small and medium-sized enterprise) and has seven offices distributed all over France and one subsidiary in Sao Paolo (Brazil). The firm's headquarters are located in southern France, in Montpellier. EI provides both human and technical services in the field of technological innovations (health and well-being, transport, energy, electronics, agriculture/agri-food, luxury goods and cosmetics, material sciences, etc.) to clients ranging from start-ups to large multinational firms. In 2016, the company's turnover was 6.2M€, and the staff consisted of 75 persons (PhD holders, engineers, financial and fiscal analysts, and administrative assistants) spread over the firm's subsidiaries. It is interesting to note that between 2015 and 2016 the staff almost doubled, shifting from 40 to 75. EI's offering regarding services are: 1) Consulting; 2) Funding; 3) Project Management and 4) Internal Innovation Academy. Table 21 below briefly details those services.

Service	Description
1) Consulting	Strategies to generate, fund, formulate, select and share a portfolio of innovation projects and prioritise as well as set a budget for Research, Innovation, and Development (RID) portfolios. Consulting services also include developing marketing studies, managing change and lean innovation.
2) Funding	Developing project proposals for subsidies, loans, cash advances, research tax credits. Identifying the best funding solution for RID projects among local, national and international funding schemes. Finding, then establishing partnerships and consortiums around innovation projects.
3) Project Management	Managing complex innovation projects from the very first opportunity to market introduction. Applying techniques such as value engineering, lean development, risk management, management of external collaboration, planning, boards reporting, etc.
4) Internal Innovation Academy	Enhancing internal and staff's know-how through extensive training sessions on the firm's information system but also on other IT-based decision-making tools in the field of RID portfolio management, risk management, etc. before the employee's intervention at the client's premises. The training sessions are provided by both internal and external coaches and delivered to all consultants concerning their needs regardless of their status (intern, junior consultant, confirmed consultant or senior consultant).

Table 21: Efficient Innovation Corporation's Services

In every project, Efficient Innovation Corporation depends on the possibility to combine different consultant profiles concerning the clients' needs, to associate key industry specialists with innovation business experts and to capitalise on competencies and experience acquired from hundreds of missions. As for France, the firm counts on being geographically and strategically close to its clients with multiple subsidiaries, establishing itself at the main corners of the "Hexagone" (France), as well as having a central office in Paris. Accordingly, each subsidiary employs a team of consultants (ranging from 3 to 15 employees) with a proportional ratio of employee statuses (junior/experienced/senior/manager). These teams are geographically spread as follows:

Figure 22: Efficient Innovation Corporation Subsidiaries in France

Concerning the locations of the firm's offices on the map, the firm groups one or more subsidiaries regarding geography, assignments and middle management. For instance, EI has five groups of subsidiaries called and detailed as follows:

- West: grouping two subsidiaries (Nantes and Bordeaux);
- East: one subsidiary (Lyon);
- South: grouping four subsidiaries (Aix-en-Provence, Montpellier, and Toulouse);
- North: one subsidiary (Paris);
- Brazil: one subsidiary (Sao Paolo).

Each of the groups mentioned above has a manager with distinct turnover objectives.. On a larger scale, these groups are supposed to compete in a "friendly" manner to go beyond their defined objectives, creating prosperity in each group. Each subsidiary takes over assignments with respect to the 200-km parameter. For instance, these groups work on assignments in the "Province" regions for start-ups and SMEs mainly. On the other hand, a more "virtual" subsidiary, called Large and Middle Size (LMS), exists at EI. LMS consists of a 20-person team of consultants working essentially at the Parisian office. LMS exists to do

large and middle-sized complex assignments for large and middle-sized companies located within a 200-km perimeter around Paris. However, unlike the other five groups, the LMS team has the exclusive right to take over any large or middle-sized customer firm located outside the perimeter, anywhere in France and the world. The virtual group has developed work methodologies particular to large and complex situations that it encounters at its client firms, consisting mainly of big industrial companies. Accordingly, Table 22 below briefly lists the type of assignments that each of the six groups performs at EI. Administrative assistants, HR staff, and communication specialists are excluded from this list.

Subsidiary	**Description**
West	A team of six consultants. They perform all four activities of EI, mainly for start-ups and SMEs.
East	A team of six consultants. They perform all four activities of EI, primarily to start-ups and SMEs.
South	A team of seventeen consultants. They perform all four activities of EI, primarily to start-ups and SMEs.
North	A team of nine consultants. They perform all four activities of EI, primarily for start-ups and SMEs.
LMS	A team of eighteen consultants. They perform all four activities of EI, primarily for large enterprises and big industrial groups.
Brazil	A team of three consultants. They perform two activities of EI, mainly for large companies and big industrial groups.

Table 22: Groups of Subsidiaries of Efficient Innovation Corporation

EI consists of three ranks of consultants: 1) Junior Consultants (around 40% of the total staff); 2) Experienced Consultants (around 40% of the total staff); and 3) Senior Consultants (10% of the total staff). Each team has a manager who is considered as a senior consultant. Finally, the company has a president, a director-general (DG) and five administrative assistants. Table X below details further the characteristics of each of the teams.

Type	**Description**
Junior Consultant	With less than three years of consulting experience, an advanced degree from an esteemed engineering or business school, a junior consultant will possess crucial professional skills and excellent soft skills. During the internal training period, s/he will learn the values, methods, and tools of Efficient Innovation Corporation. Although working autonomously, junior consultants are mentored by an experienced consultant who ensures their continuous development within the firm.

Experienced Consultant	With three to five years of consulting experience, this consultant acts as a project manager for customers. S/he manages teams of junior consultants and maintains and develops a portfolio of missions, also practising critical appraisal to improve Efficient Innovation Corporation's internal processes and the company's tools and methods, and always adapting to a continuously evolving innovation.
Senior Consultant	With more than eight years of experience, the senior consultant works primarily with Efficient Innovation Corporation's key accounts, managing their major and strategic projects. With an attentive ear and an analytical mind, s/he should be capable of managing teams of consultants efficiently and is fully aware of the specifics and issues at stake in each mission.

Table 23: Efficient Innovation Corporation Consultants' Ranks

One of EI's principal activities is RID project portfolio management (service #1 and #2 – see Table 21). EI applies project prioritisation and selection methodologies in its assignments, using both human and IT-based tools and algorithms. For example, the firm assists its clients in determining the eligibility of its RID projects, in a broad portfolio of technological projects, to a French public funding scheme, called the "Research Tax Credit", "Crédit d'Impôts Recherche" in French, or simply "CIR". The CIR is a yearly tax incentive that reimburses 30% of the total Research and Development (R&D) costs engaged by French firms. In 2013, EI developed in-house an alpha version of a Decision Support System (DSS), an eligibility scoring tool based on a set of governmental criteria that govern project selection. To have an "eligibility" score, RID project managers at client firms must answer a series of around 40 questions. Then, each project in the client's portfolio is given a score, which expresses the extent to which set the CIR eligibility criteria were met. The scoring tool consists of checklists, among other things, evaluating the degree to which each project fulfils certain eligibility requirements. The scoring algorithms use purely additive or multiplicative algorithm to summarise the eligibility criteria expressed by the French government, which are compiled by filling out a questionnaire. The algorithm behind the DSS is crafted, programmed and upgraded by a group of confirmed consultants at EI, having an extensive know-how in the eligibility criteria. The algorithm assigns a "weight" to be allocated to individual criterion to emphasise the importance of each. The DSS allocates the current value to each indicator deemed to be essential in RID project selection. Finally, the eligibility screening is automatically illustrated on three levels and axes (novelty/new knowledge level, technical uncertainty level, and experimental development level, as assessed by the French government). Based on the scores generated by the decision support system, the assigned consultants would be able to provide a "legitimate" consulting advice on project eligibility, sharing the risks with the clients that must provide very accurate answers to the questions raised by the DSS. Risk minimisation is the reason for which clients

ask for EI's services. Risks occur when a client firm benefits from CIR's tax incentive on non-or-partially eligible projects. In case of governmental control, the client firm might face legal actions ranging from partial to full restitution of the CIR gathered earlier, putting in jeopardy the company's treasury. In an attempt to reduce the risk to the minimum, the assigned consultants also perform qualitative face-to-face interviews with RID project managers to assess the real R&D nature of the projects, and thereby assess their eligibility to the CIR.

EI does not have "specialised" IT employees. However, a few consultants have little knowledge in IT support and handles the fundamental maintenance of the existing IT (computers, printers, routers, etc.) on a part time basis. The information system of EI consists of the following IT tools:

(1) an ERP deployed in 2009, which aims to manage financial operation and accounting, day-to-day operations, skills, absence and presence sheets, assignment planning, progress monitoring, profitability, as well as reporting;

(2) Internal Wiki, that aims to share the firm's calendar, consultants' information such as phone number, etc.;

(3) Free version of Dropbox for file sharing between employees and between employees and clients (each consultant had to setup a free version of Dropbox);

(4) Free version of Skype in order for consultants to exchange messages as fast as possible;

(5) Externalised email server at Microsoft;

(6) more than ten decision support systems consisting of Excel spreadsheets using macros, usually developed in-house progressively by ad-hoc initiatives, through independent and isolated developments whenever a "motivated" consultant had free time.

Consultants designed These DSS in accordance with the specifications and needs of the assignments they face. These isolated, distinct and independent developments have been able to improve individuals' efficiency but also caused a lack of coherence as well as an excessive growth of applications, according to the top management. The DSS are structured around a huge quantity of Excel files through which consultants must manually extract them at different work sites. Consequently, this was highlighted by a DSS access problem. For example, a consultant working in Paris does not know whether a tool had been already developed by another consultant working in Lyon. He should then contact a consultant in Montpellier who centralises tools from to time to time, and may know how to browse the database located in Montpellier and communicate or send the needed tool.

As for the most important DSS developed in-house is the R&D portfolio management tool (PMT) developed by a group of experienced consultants (n=3). The PMT was initially designed because these employees were complaining about the lack of time and efficiency in their assignments. Without the PMT, they must analyse the CIR eligibility of a vast number of R&D projects at a client's portfolio with a purely mental activity and extensive on-site physical presence. According to them, it is very time-consuming to perform assignments, especially when they are required to visit many project managers at multiple work sites, having several time constraints and limited resources. Consequently, the PMT was tested and used a few times but was yet been fully diffused to other consultants in the firm. Furthermore, when the PMT was developed, no formal communication at EI took place to inform other consultants and key users on its intended objectives and on how it works. The PMT, in its first version, had few technical and ergonomic elements missing, according to another group of four experienced consultants working at the firm that were expected to act as "early adopters" of the PMT.

For instance, when the group of four consultants was asked by executives to test the PMT in their assignments before deploying the tool on a full scale at EI, they opposed to do so. They expressed discomfort and demotivation, stating that they did not trust its technical capabilities nor the algorithm behind it. Consequently, the manager of the R&D portfolio management department at EI (Mr Dupont), asked for an extensive upgrade of the existing PMT through a complete review of the algorithms behind it, its ergonomic aspects as well as a redefinition of the reasons for which it should exist and used. Several meetings organised by the manager reunited the two categories of consultants ("detractors" and "partisans") involved in the PMT upgrade project. These meetings turned out to be unsuccessful, because no agreement was made on the fit between organisational needs and the PMT's deliverables, and a conflict between different groups arose causing the suspension of the DSS implementation project (see Table 24).

Group of consultants	**Number**	**Category**
Experienced	4	"Detractors"
Experienced	3	"Partisans"
Managers (incl. DG)	2	"Partisans"

Table 24: Groups of Consultants Involved in the Conflict Toward the PMT

At this point, EI's top management, convinced of the PMT's benefits on consultants' efficiency and productivity, showed interest in information systems research in an attempt to solve this conflict. For instance, the director-general (DG) of EI is an ex-researcher in

management himself. According to the DG, it would be necessary to tackle both the PMT upgrade project and conflict resolution, in parallel, from a research point of view instead of a "consulting" point of view. Additionally, he did not want to engage external specialists (consultants) to manage the project because he had a short budget and thereby could not afford the fees of specialised IS technicians. The main objective of the DG was to investigate why decision support systems for R&D portfolio management "did not work" in general. According to him, to his knowledge and experience, it is very complicated to design and develop a successful DSS that can integrate the numerous variables and criteria. Moreover, even if these systems exist in the market, the DG argued that "nobody use them". Accordingly, to understand the reasons for which managers need R&D management decision support systems, while at the same time, do not use them when they exist, the DG decided to hire a doctoral candidate in information systems to tackle this issue with a research point of view. Consequently, I got hired as a PhD student in Information Systems.

When I started my investigation at Efficient Innovation Corporation, the DG wanted me to work on designing a new (beta) version of the PMT while reviewing the literature in information systems to understand why its first version have witnessed conflict and resistance behaviours by key employees of EI. Indeed, EI did not succeed in deploying the alpha version of the PMT. Then, both the DG and Mr Dupont wanted to successfully develop then implement an upgraded version of the PMT to be used by consultants at the firm. I was asked to join the team of innovation management consultants that often work on R&D portfolio management assignments to understand in depth their technical specifications. My role at the firm was therefore double: (1) Researcher/Doctoral Candidate and (2) Junior Consultant.

On the other hand, a paradox on the core activity of EI is the firm was a management consulting firm whose business was technology and innovation management. However, EI was unable to implement innovative services comparable to the one it was conceiving and selling. Therefore, this empirical field was consistent with my research objective and acted as a path to observe how conflicts behaviours were likely to evolve to contaminate individuals and to participate in problem-solving by proposing solutions from research to be directly tested on the field. As a doctoral student, my primary role was to produce a mutually agreeable outcome for all the participants in the project with the process being maintained by them afterwards. To accomplish this, I also had to play different roles at various stages of the project's process, including those of listener, observer, synthesiser, planner, designer, reporter, and catalyser.

Consequently, my project consisted of a collaborative study with Efficient Innovation Corporation. It lasted over three years, during which I was involved with the project team (EI

employees: the DG, the HR manager, Mr Dupont and his team of three experienced consultants and "partisans" of the PMT, one experienced consultant in charge of IT maintenance, and four experienced consultants, "detractors" of the PMT). Additionally, the top management gave me clearance to interview any of the 75 individuals working at EI when and if needed. I was asked to work on premises on the base of four days per week. More specifically, EI gave me full access to the firm's documentation, facilities, Human Resources (HR) staff, administrative and finance personnel and consultants in charge of the EI's information system and IT tools. Additionally, by joining the team of junior consultants, I also had "access" to my colleagues, managers, clients, etc. Throughout the project, I realised that because of my role at EI, I had an excellent opportunity to observe on a daily basis, how the project's direct and indirect participants have been dealing with conflicts, and how conflicts evolved to influence other individuals in the firm. This allowed me to identify which research theories should be mobilised to understand the negative behaviours, but also try to solve the organisational issue, which was the prime role, as seen from the top management.

2.2 Qualitative Research

A motivation for doing qualitative research comes from my observation that, if there is one thing which distinguishes human beings from the rest of the natural species, it is our ability to feel, change, interact, react, talk and think. Furthermore, conflicts in firms evolve, which justifies the higher adequacy of process analysis over static analysis (Jehn and Mannix, 2001). Consequently, qualitative research methods would permit IS research practitioners to understand "changing" individuals and the social and cultural contexts within which they live and evolve (Myers, 2013). For instance, when "spoken" data are "quantified", researchers could lose the possibility to understand the precise phenomenon occurring in its particular social, behavioural and institutional context. Qualitative research is a "social" research in which the researcher counts on text data rather than numerical data (Carter and Little, 2007). According to Schwandt (2001), qualitative researchers do not convert text data to numbers for analysis purposes. Instead, they analyse data in their textual type to understand their meaning in the human context. Consequently, the researchers tend to formulate open questions about organisational issues as they occur in the firm rather than testing predetermined research hypotheses (Schwandt, 2001).

To detail the Methodology section of my thesis in a simple way, I was inspired by the model of the simple relationship between epistemology, methodology, and method, of Carter and Little (2007) showed in Figure 23 below.

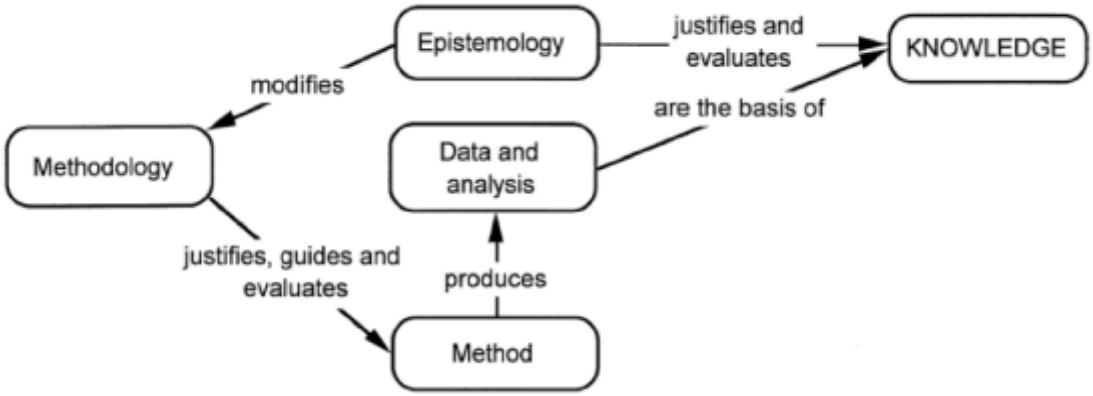


Figure 23: The Simple Relationship Between Methodology, Epistemology and Method (Carter and Little, 2007)

According to Carter and Little (2007), defining "Epistemology", "Methodology", and "Method" used in qualitative research is often conflicting, although clear differences could be made between these terms. Table 25 below defines each of these terms.

Term	Description	Authors
Methodology	Methodology deals with the justification of the methods used in research. It is the theory and analysis of which method research should follow, and not the methods themselves.	Carter and Little, 2007; Harding, 1987
Epistemology	Epistemology justifies knowledge generated from the research. It is the investigation of the nature of knowledge and justification. Epistemological issues are about justification strategies.	Carter and Little, 2007; Schwandt, 2001; Harding, 1987
Method	The method consists of the techniques used to gather evidence regarding procedures, tools of research.	Carter and Little, 2007; Schwandt, 2001; Harding, 1987

Table 25: Definitions and Explanations of Key Terms in Qualitative Research

The methodology justifies which method should be used, which in turn provides data and analyses. Epistemology adapts methodology and justifies knowledge generated (Carter and Little, 2007). Finally, knowledge, or results, are created from data and analyses.

2.2.1 Methodology

Before I tackle the methodology used in this thesis, it would be essential to state the reasons, between others, for which I decided to employ an Action Research (AR) methodology. Because my thesis is "CIFRE-based", I was required by the contract signed with EI to follow a scientific approach that gathers observation, design and solution-implementation. Accordingly, AR reflected a coherent choice with respect to the requirements of the signed CIFRE contract. AR is applied research that aims to develop a solution for an organisational problem that is of practical value to the individuals with whom the researchers are working (Davison et al., 2004). Because I was supposed to improve the organisational situation by solving conflicts and implementing an upgraded IT tool, the AR methodology was particularly adapted. Furthermore, a CIFRE thesis has two objectives: (1) to work collaboratively with the host company to enhance its organisational performance, and (2) to participate in the production of knowledge in the context of scientific research (Rasolofo-Distler and Zawadzki, 2013). Then, in contrast to other research methodologies, AR is not restricted to the mental construction of reality but involves the concrete construction of models and management tools (David, 1999). The CIFRE allowed me to access to the privileged terrain as a very employee of EI. That said, the CIFRE differs from the three models of consultation introduced by Schein (1987), *"the purchase of information or expertise, the doctor-patient model and the process consultation model"*, in the sense that it relies on the real knowledge of the host company. In his overview of the methodological approach of action research, O'Brien (2001) stated the following: *"What separates this type of research from general professional practices, consulting, or daily problem-solving is the emphasis on scientific study, which is to say the researcher studies the problem systematically and ensures the intervention is informed by theoretical considerations. Much of the researcher's time is spent on refining the methodological tools to suit the exigencies of the situation, and on collecting, analysing, and presenting data on an ongoing, cyclical basis".* Accordingly, my research sits within the authors' assumption. As a PhD student with a CIFRE contract, I was an employee of EI with the position of "researcher", and not just a practitioner engaged in a reflexive process (Schön, 1987). On the other hand, I was required to defend my thesis before December 2017, having signed my contract in October 2014.

AR is promoted and practised as one way to conduct empirical research within IS discipline. Baskerville and Wood-Harper (1998) and Baskerville (1999) largely contributed to its evolution. In the IS literature, AR is classified through various forms (around twelve forms),

each characterised by different process models (Baskerville and Wood-Harper, 1998), objectives and structures (Baskerville, 1999) (see Table 26).

Process Model	Description
Iterative IS AR	Iterative IS action research consists of iterations as primary organising principles. The entire set of research activities is repeated until the practical problem is resolved.
Reflective IS AR	Reflective IS action research is used when the researcher is no longer capable of explaining his/her behaviours in his/her understanding. Thus, diagnosis and iteration are used in an attempt to understand these behaviours, but iteration is not the objective.
Linear IS AR	Linear IS action research implies that the process should constantly progress from initiation to conclusion, and activities are not ought to be repeated until a result becomes settled.

Table 26: Action Research Process Models

The main purpose of AR is to solve organisational issues through intervention while at the same time contributing to theoretical knowledge. However, some authors such as Cohen and Manion (1980) and Avison (1993) criticised AR for its lack of rigour in methodology, or its resemblance to consulting. Furthermore, Dickens and Watkins (1999) argued that AR tends to produce either *"research with little action or action with little research"* (p. 131). On the other hand, Davison et al. (2004) tackled these criticisms by proposing a set of interdependent principles and criteria that researchers, practitioners and reviewers can use both to ensure and to assess the "rigor" and "relevance" of Canonical Action Research (CAR) – a highly used form AR in the IS literature. According to the same authors, "rigour" leans "strict precision" and "exactness", as for the correct use of methods and analyses appropriate to *"the tasks at hand"* (Benbasat and Zmud, 1999, p. 5), that both embody a solid theoretical base and are accepted by the respective research community (Davenport and Markus, 1999). "Relevance" reflects research that focuses on practical concerns, and provides real value to IS professionals (Benbasat and Zmud, 1999, p. 5). Zmud (1996) adds that *"strong relevance is an attribute of research that surfaces not only findings relevant to practice but also reveals both how the findings would be implemented in practice and the validity-in-practice of those findings"*. Davison et al. (2004) conclude by arguing that any research activity that claims strong relevancy would possess an AR component de facto. According to the same authors, the term "canonical" is employed to formalise the association with the iterative, rigourous and collaborative process-oriented model developed by Susman and Evered (1978). The "canonical" status was used because of the wide adoption of the model in the field of social sciences (Davison et al., 2004). In my case, I will use the CAR principles and criteria of Davison et al.

(2004) to facilitate the clear and systematic presentation of ideas and findings and justify my choices of action, my contributions to IS knowledge and conclusions (Davison et al., 2004).

2.2.2 Action Research Forms

Baskerville and Wood-Harper (1998) provided a clear description of AR forms (see Table 27). Then, Susman and Evered (1978) made a seminal contribution to AR through a model of cyclical research process.

Form	***Process Model* / Description**	**Authors and IS published studies**
1) Canonical Action Research (CAR)	*Iterative:* CAR is a form of AR that is iterative, rigorous and collaborative with usually several cycles of activities to tackle the problems in a firm. CAR focuses on both organisational development and knowledge generation.	Hasan et al., 2017; Malaurent and Avison, 2016; Payton, 2016; Smith et al., 2010
2) Information Systems Prototyping	*Iterative:* Information Systems Prototyping is a framework for research into application contexts. "Prototypes" are used by IS designers as a mechanism to facilitate user validation of system designs.	Connell and Shafer, 1989; Iivari and Karjalainen, 1989; Naumann and Jenkins, 1982
3) Soft Systems	*Iterative:* Soft Systems' objective is characterised as both organisational development (human oriented) and system design (technical oriented). IS design is considered as a contributor of models and instances of purposeful human activity systems.	Checkland and Scholes, 1990; Checkland, 1981
4) Action Science	*Reflective:* Action Science seeks rigour in high standards of practical knowledge, which is defined as contextual precision within social reality, where practical knowledge is relevant to its purpose and norms.	Argyris et al., 1985; Argyris and Schön, 1978
5) Participant Observation	*Reflective:* The researcher is typically seen as an authoritative and reliable expert by the research subject, involved as a participant in their daily lives. S/he, however, does not play any collaborative or facilitative role regarding immediate problem setting occurring in the context.	Jorgensen, 1989; Yin, 1989; Jepsen et al., 1989
6) Action Learning	*Reflective:* Action learning, also called experiential learning, is a passive pedagogical technique (classroom or laboratory work) used for improving individuals' learning in highly applied fields which involve social settings.	Pedler, 1997; Burnard, 1991
7) Multiview	*Linear:* Multiview is a flexible framework which allows the researcher to alternate between different methodologies, adjusting his/her framework according to the particular problem situation.	Avison and Wood-Harper, 1990; Wood-Harper et al., 1985
8) ETHICS	*Linear:* The Effective Technical and Human Implementation of Computer Systems approach considers the researcher as a facilitator in design teams to explain technical issues and elicit human needs impacts from the people who will be involved in operating the system.	Mumford, 1993

9) Clinical Field Work	*Linear:* The Clinical Field Work sees the research issue from a clinical perspective requiring very highly trained professional researchers who facilitate and get involved in a helping role with individuals, groups, communities or organisations.	Hammer and Champy, 1993
10) Process Consultation	*Linear:* Process Consultation requires the introduction of an outside expert consultant with a primary goal of teaching the client how to self-help on the short run but also on the long term. The approach is linear, where the researcher is not facilitative but has the aim to enhance organisational development.	Coad and Yourdon, 1991

Table 27: Action Research Forms

To answer my research questions and try to bring the change needed at Efficient Innovation Corporation, action research was deemed as the most consistent research methodology. Moreover, since AR is considered as a form of collaborative social research between the researcher and the participants (Miles and Huberman, 1994), and because conflict behaviours are "human" issues, AR in general, and the iterative process of AR in particular were the most suitable for my case study. According to Lee (2004), the importance of AR lies in its characteristic of both using research theories and facilitating organisational change. In the IS field, Barkerville and Wood-Harper (1996) posit that AR methodology is highly pragmatic and places IS researchers in an assisting-role within the firms they are observing. Pragmatism is concerned with action and change and the interplay between knowledge and action. This makes it appropriate as a basis for research approaches intervening into the world and not merely observing the world. Since AR has the particularity of orienting the researcher toward the research process instead of research results (Baskerville and Wood-Harper, 1998), the collaborative and social interactions that would occur during the AR process would be essential in my case. Accordingly, the main outcome of AR is increased know-how of the social context, practical issue solving, and an expansion of scientific knowledge (Baskerville and Wood-Harper, 1998). The scientific knowledge acquired by the researcher ought to be directly applied in the field, which fills the gap between practice and theory, according to the same authors. Through AR, IS practitioners shift to be organisational scientists instead of academic scientists (Clark, 1972). Nevertheless, the action researcher should ensure collaborative work with participants and must agree to a set of procedures. In my case, I was hired as an employee of the firm. Therefore, I was bounded by the procedures of Efficient Innovation Corporation and the outcomes expected by the top management.

That said, over the years, AR has been facing some criticisms (Davison et al., 2004). Some critics posited that AR tends to be either *"research with little action or action with little*

research" (Dickens and Watkins, 1999, p.131). Other critics were that AR is incompletely different from consulting (e.g. Avison, 1993), or that it lacks rigour and relevance (e.g. Cohen and Manion, 1980). Additionally, Kock (2007) argued that one of the major pitfalls of AR is the researcher's subjectivity. In response to these criticisms, some scholars have attempted to shed light on the differences of AR from other methodologies as well as on the unique advantages of AR (Davison et al., 2012).

In my case, I have used the set of structured principles and associated criteria that may be employed to ensure both rigour and relevance of action research (Davison et al., 2004). Moreover, even if I was considered as an employee at EI, I was still, above all, a PhD student and a researcher working for the broader IS research community (Baskerville and Wood-Harper, 1988) to which I have been reporting my research findings. On the other hand, variants of action research also exist as a large number or research methods in the field of social sciences claim to rely on a "field" approach (David, 2002). However, according to the same author, the researcher's position vis-à-vis the field (whether s/he is an indirect observer, or on the contrary, s/he voluntarily intervenes in the course of things) provides very different knowledge. The concept of "intervention" is however common to distinct methods developed to *"produce practical knowledge that serves action, and also more general theoretical knowledge"* (David, 2002). Hence, variants of AR include, among others, the following: grounded theory (Glaser and Strauss, 1967), cooperative inquiry (Reason and Heron, 1986), action science (Argyris, 1985), "engineering" management research (Chanal et al., 1997), diagnostic action research (Koenig, 1997), problem structuration methods (Rosenhead, 1989), participatory action research (Fals-Borda and Rahman, 1991), action inquiry (Torbert, 1981), decision-aiding science (Roy, 1992), and intervention research in the management sciences (Hatchuel and Molet, 1986) etc.

AR in the form stated by Kurt Lewin in the 1940s was a kind of engineering science employed for researching strategies for social change. As shown above in Table 27, AR has many forms. Canonical Action Research (CAR) is one of numerous AR variants that have been developed within the IS community with the objective of researching organisational change in the IS field (Davison et al., 2004). Back to my field at EI, because IS plays an essential role in implementing a decision support system, CAR seems to be an interesting form of AR to be used. It is also interesting to note that CAR was argued to be robust (Davison et al., 2004) through a series of five principles that have been developed following the analysis of multiple IS AR failure cases. On the other hand, EI did not expect that I dominate the research process disregarding other employees at the firm. Instead, the top management was eager to involve

many of its employees, both senior and junior consultants, as well as managers, in the research process. The director-general of EI is himself a researcher in innovation management. He argued that a research-oriented interventionist approach was needed to generate "special" interactions, collaboration and sustainable solutions to the firm's organisational issue. Hence, Davison et al.'s (2004) Canonical Action Research (CAR) form was deemed as a suitable approach for my research.

2.2.3 Canonical Action Research (CAR)

Davison et al. (2004) argue that the collaborative nature of CAR requires that both researchers and "client" firms must work together in roles that are culturally appropriate given the particular circumstances of the problem context. CAR was deemed as rigorous in my case. First, CAR implies that the researcher iterates through carefully crafted and executed activity cycles (Davison et al., 2004). Accordingly, I was required to deepen my understanding of the organisational problem (conflict behaviours and conflict contagion toward the DSS), while moving closer to a solution to the problem. Consequently, these requirements were relevant with Davison et al.'s (2004) assumption that CAR allows researchers to understand the organisational issue to propose a solution for the problem through multiple cycles of activities (Davison et al., 2004). Second, CAR implies that the process of problem diagnosis should be continuous and should involve the client throughout the cycles to plan activities that are continuously relevant to this issue, according to the authors. During the CAR project which may last weeks, months or even years (Davison et al., 2004), action researchers would have the time to build a strong relationship with their research subjects (clients – commercial, non-profit, public or other forms of organisations), and plan, execute, observe, then reflect upon actions (Davison et al., 2004). It is practically impossible to set a definitive plan for intervention as CAR deals with emergent and process-oriented organisational circumstances, where the action researcher has full control over interventions (Davison et al., 2004; Mumford, 2001). Accordingly, researchers tend to adapt their intervention techniques with the numerous variety of events and circumstances, rather than simply predefined inquiry styles and intervention techniques (Davison et al., 2004). Therefore, to conduct a successful CAR project, the action researcher must obtain an intimate and in-depth comprehension of a specific organisational issue, while tracking the evolution of the change process, including organisational constraints and idiosyncrasies (Davison et al., 2004). This would ensure that the research findings are relevant to hosting clients and truly contribute to IS knowledge creation (Davison et al., 2004; Elden and Chisholm, 1993).

As a doctoral candidate, I was expected to serve two demanding masters (Kock and Lau, 2001) – Efficient Innovation Corporation (client) and the IS academic community to which I belong (MRM research group). Accordingly, I was supposed to understand EI's organisational problem to solve it, but also develop, and apply relevant theories in IS and social sciences and disseminate findings to my research community. For all these reasons, CAR was considered as relevant to my research field. Additionally, because EI was eager for recommendations from an IS research perspective to diagnose and treat the organisational problem, akin to other forms of AR, CAR has the dual advantage of improving practice while contributing to theory and knowledge within and beyond the immediate confines of the project (Davison et al., 2004).

In an article published in the Information Systems Journal, Davison et al. (2004) designed a set of principles, which are very specific to CAR, to ensure the rigour and relevance of CAR in a given action research project. The authors have based their principles on their own extensive experience with CAR, but also on the AR literature as it has evolved since the late 1940s in the field of social sciences. However, Davison et al. (2004) argue that their principles do not take into account issues such as the ethical conduct of the researcher that are necessary for all research, regardless of the method used or the epistemological position of the researcher. Moreover, to assist researchers in planning their work, Davison et al. (2004) propose specific criteria for CAR, expressed in the form of questions. These criteria can also be used by reviewers and readers to assess a CAR project report (Davison et al., 2004). For instance, I have used the principles and criteria of Davison et al. (2004) as a pre-action-plan, rather than a post-self-assessment questionnaire, in an attempt to prepare solid CAR project foundations to be directly integrated into the research cycles of Susman and Evered (1978). Table 28[16] below synthesizes both the principles and the criteria proposed by Davison et al. (2004).

Principle	**Criterion**
Researcher-Client Agreement (RCA)	Did both the researcher and the client agree that CAR was the appropriate approach for the organisational situation?
	Was the focus of the research project specified clearly and explicitly?
	Did the client make an explicit commitment to the project?
	Were the roles and responsibilities of the researcher and client organisation members specified explicitly?

[16] This table is adapted from the five tables of criteria for CAR in the article of Davison et al. (2004)

	Were project objectives and evaluation measures specified explicitly?
	Were the data collection and analysis methods specified explicitly?
Cyclical Process Model (CPM)	Did the project follow the CPM or justify any deviation from it?
	Did the researcher conduct an independent diagnosis of the organisational situation?
	Were the planned actions based explicitly on the results of the diagnosis?
	Were the planned actions implemented and evaluated?
	Did the researcher reflect on the outcomes of the intervention?
	Was this reflection followed by an explicit decision on whether or not to proceed through an additional process cycle?
	Were both the exit of the researcher and the conclusion of the project due to either the project objectives being met or some other clearly articulated justification?
Principle of Theory (PT)	Were the project activities guided by theory or set of theories?
	Was the domain of investigation, and the specific problem setting, relevant and significant to the interests of the researcher's community of peers as well as the client?
	Was a theoretically based model used to derive the causes of the observed problem?
	Did the planned intervention follow from this theoretically based model?
	Was the guiding theory, or any other theory, used to evaluate the outcomes of the intervention?
Change through Action (CtA)	Were both the researcher and client motivated to improve the situation?
	Were the problem and its hypothesised cause(s) specified as a result of the diagnosis?
	Were the planned actions designed to address the hypothesised cause(s)?
	Did the client approve the planned actions before they were implemented?
	Was the organisation situation assessed comprehensively both before and after the intervention?
	Were the timing and nature of the actions taken clearly and entirely documented?
Learning through Reflection (LtR)	Did the researcher provide progress reports to the client and organisational members?
	Did both the researcher and the client reflect upon the outcomes of the project?
	Were the research activities and outcomes reported clearly and completely?
	Were the results considered regarding implications for further action in this situation?
	Were the results considered regarding implications for action to be taken in related research domains?
	Were the results considered regarding implications for the research community (general knowledge, informing/re-informing theory)?
	Were the results considered regarding the general applicability of CAR?

Table 28: A Matrix of the Five Principles and Thirty-One Criteria of CAR

Action researchers are asked to perform a deep diagnosis of the organisational problem before intervening and producing learnings from the results (Davison et al., 2004). Accordingly, AR is an inquiry method based on the assumption that theory and practice can be closely tackled. For instance, Davison et al.'s (2004) criteria and principles would assist the researcher in improving both the rigour and relevance of CAR vis-à-vis his/her research community. In the discussion section of their article, Davison et al. (2004) provide details as for how the principles of CAR contribute and confirm the validity-in-practice and the validity-in-application of knowledge generated throughout the project. Below is a summary of the authors' assumptions:

1. RCA: Researcher-Client cooperation and communication, as well as the involvement of the main actors from the beginning of the project, increases the relevance of the CAR project to the clients' interests. Hence, both CAR rigour and relevance are enhanced;
2. CPM: Applying CPM over multiple research cycles will facilitate an extensive understanding of the organisational issue and the theories used to tackle it. Thus, CAR rigour is enhanced;
3. PT: Associating the researcher's change interventions with a theoretical framework represents both an assessment of validity-in-practice and the validity-in-application of theory-based interventions. CAR relevance is therefore enhanced;
4. CtA: The principle implies that the planned actions of change should both follow from the hypothesised causes of the organisational problem(s) and improve the problematic situation. Here, rigour and relevance should not have an inverse relationship;
5. LtR: Both the researcher and the practitioner define what they have learned in an explicit, systematic and critical manner. Moreover, action researchers should contribute to the continuous improvement of AR methods as a result of their experiences.

To conclude, Davison et al. (2004) argue that the main purpose of their principles and criteria are to improve the quality of contemporary CAR. Furthermore, they posit that a failure to follow any of these principles should not be a cause to reject academic publications using CAR, but instead to justify any deviation from them leading to a more thoughtful, reflective and enhanced CAR methodology for future research headings.

2.2.4 Epistemology

For my methodology to be considered as rigorous, it should also be discussed in line with the epistemological posture. Additionally, discussions on epistemology lead to define the dimensions and limits of the methodology and improve its applicability. AR in the European school of thought is often associated with the constructivist paradigm (Avenier and Nourry, 1999). Baskerville and Wood-Harper (1996) argue that AR is an interesting contemporary methodology in information systems research, because of its practical benefits for practitioners. However, several epistemological analyses (paradigms) may be associated to AR. Therefore, it would be important to analyse AR briefly by three dominant research streams: 1) Positivism; 2) Post-positivism; and 3) Constructivism/Interpretivism. Table 29 below briefly describes these three.

Paradigm	Description	Authors
1) Positivism	Positivism posits that a scientific methodology permits researchers to separate personal values from facts. The scientist should isolate him/herself from the phenomenon on which s/he is working to be objective. Consequently, the researcher can attain objectivity.	Capurro, 2001; Cohen and Manion, 1994; Hitchcock and Hughes, 1989
2) Post-positivism	Post-positivism is not a paradigm by itself; it is rather a "stream" of philosophers that did not agree with positivism. Post-positivists argue that the best way to learn about the best interests of society is to ask the society itself. Because "reality" is complex, the post-positivist researcher should gather data from multiple sources, considered as participants of his/her research, to acquire as comprehensive a grasp on reality as possible.	Lakatos, 2014; Onwuegbuzie, 2000; Morris, 1999; Kuhn, 1996; Cary, 1988; Popper, 1972
3) Constructivism/ Interpretivism	Constructivism and interpretivism are related concepts that aim to understand the world as others experience it. Constructivism philosophers argue that knowledge is subjective because it is socially constructed and mind dependent. Then, the truth is found within the human experience. Hence, arguments on what is true or false are dependent on the context. Within this context, communities' ideologies, belief systems and claims of spiritual and earth connections find space as legitimate knowledge.	Rockmore, 2008; Avenier et al., 1999; Crotty, 1998; Gillet, 1998; Piaget, 1967

Table 29: Three Main Research Epistemologies Associated to Action Research

First, in the positivist point of view, the researcher tackles the studied issue from an objective perspective and describes, interprets and explains situations without making any personal judgements. This paradigm deals mainly with facts and figures, through a quantitative approach to research. The natural sciences research streams (such as biology, chemistry and physics) underwent a significant transformation between the 18th and the 19th century.

Positivist philosophers argue that science is the only foundation for true knowledge. They posit that to investigate the world in a social context, the methods, techniques and procedures employed in the natural sciences offer the best pathway for doing so. Auguste Comte is the father of positivism. He defended a rigid empirical approach in which knowledge is directly based on experience. His approach emphasised the facts and causes of behaviour (Bogdan and Biklen, 2003). Moreover, scientific knowledge is more representative of truth than that derived from metaphysical speculation (Schwandt, 2001). Hence, positivism partisans typically apply the scientific method to investigate human action. Today, positivism is considered as being "objective", that is, objects surrounding people exist and have a meaning, which is independent of one's consciousness of them (Crotty, 1998). Positivism argues that the researcher must be neutral toward the observed phenomenon. The object of the research is not permitted to get involved and act in the research process. Consequently, in the positivist approach, once objective knowledge is reached, results derived from the investigation can be diffused and generalised so that all the world can benefit from them since they are assumed as true and independent from time and space (Nobli and Eaker, 1987). The positivist paradigm, therefore, induced research laws prohibiting researchers from confusion about how to conduct their experiments.

In my research, the positivist epistemological analysis is not suitable as this paradigm consider the phenomenon as an objective cause-effect relationship to be discovered by researchers in a "neutral" way, having no influence on research participants' behaviours. Through action research, I needed to go against the one-dimensional linear cause-and-effect bond, interact with the research subject, propose solutions to the issue, observe and assist in the implementation of these solutions.

Second, the 20th century saw a shift from positivism to post-positivism. The post-positivist period and research stream argued that the researcher must take into account the multiple possibilities, different points-of-view and perspectives, and distinct variables that may affect the proceeding of the whole (Lor, 2011). The period of post-positivism provides an alternative methodology for scientific research. Between the 1950's and 1960's, the post-positivism research stream accepted the complexity of social issues, and therefore criticised positivism as a rigid scientific approach that aims to investigate social phenomena as holistically as possible. The post-positivist paradigm has his roots in anthropological studies. These studies argue that the western social and cultural values are not universally valid (Lor, 2011). Consequently, post-positivist researchers tended to oppose the idea of one objective truth and applied alternative thinking over social problems empowering research participants

(Yang, 2006). In other words, post-positivists, such as Popper (1972), accused positivists of using science as a social, political weapon to impose ideas, values, and assumptions of hegemonic powers as facts to be applied to other cultures. Indeed, the post-positivist research stream posits that practitioners should involve themselves in their very research as much as possible, and reach conditional realities to help individuals solve practical and daily life issues (Kuhn, 1976). However, post-positivists have been criticised because of the conditional and temporary nature of their resulting conclusions. Ryan (2006) states that results' generalisation in the paradigm is questionable because of conclusions are regarded as a temporary station in an ongoing evolution of social reality.

Therefore, some similarities between the characteristics of my action research methodology and the post-positivist epistemological analysis can be made. A conclusion, should it ever exist, analysed through a post-positivist epistemology, turns out to be a starting phase of further research, requiring further post-positivist research. Accordingly, the main challenge of my research is to be able to get out of the "infinite research loop" when my action research would stop. Complementary epistemological approaches may provide me with the major assets to do so.

Third, the interpretivist paradigm posits that social reality is not like natural reality because the subjects of social reality are human beings that interact with each other (Noblit and Eaker, 1987). The interpretivist approach is subjective in contrast with positivism. To complement and fill the gaps found in post-positivism, interpretivist research allows less structured techniques such as hermeneutics, phenomenology and ethnography (Lor, 2011). On the other hand, constructivists argue that, because the reality is mind-constructed, mind-dependent and knowledge-subjective, a social inquiry is therefore value-bound and value-laden. The researcher is hence impacted by his/her values, which inform the paradigm s/he chooses for the study, the topic, data collection and data analysis, data interpretations and learnings specifying. Accordingly, a constructivist researcher ought to state the value-laden nature of his/her study as well as the biases that may interfere with neutrality.

Moreover, the paradigm of interpretivism requires that both research participants and the researcher interact together to produce results. The researcher's conclusions and knowledge are not universally valid and are restricted to the particular interaction context and time (Lor, 2011. In other words, unlike positivism, interpretivism research does not consist of objective laws and facts and does not face generalisation questionings because it only focuses on explaining current situations and nothing beyond it. Furthermore, the paradigm posits that the epistemology is seen to imply an alternative conception of scientific criteria taking into

consideration the human context (Susman and Evered, 1978). For instance, AR posits that the researcher has special access to insights from his lived experience as an insider. S/he is better suited to establish interactions and connections needed to conduct a study (e.g., asking for special permissions, gathering necessary equipment, reaching subjects in the field, managers, etc.). In contrast with the positivist paradigm, interpretivist research seems to be conducted by scientists that are considered as "inside outsiders" at the studied firm. For example, at Efficient Innovation Corporation, I was hired as a management consultant with the "hat" of a researcher. Therefore, findings and conclusions from my study are related to issues lived by "me" in the firm without being a "standard" or normal member of the company. However, despite the very common grounds between the interpretivist paradigm and action research, the interpretivist approach may tend to place the researcher as "superior" over research participants by creating a democratic and social environment (Eliot, 2007) where participants control the research process. Furthermore, interpretivist research does not allow the researcher to implement a solution or change until the completion of the research. In other words, both positivists and post-positivists are not always 'practicable" due to the very long intervals between the beginning and the end of the study (Feldman, 2007), and the researcher's incapacity to test and practice solutions during the research process when needed.

To conclude, action research seems to be associated the most with the constructivist paradigm. Additionally, AR goes beyond these research paradigms to include other epistemologies such as constructive or critical theoretical approaches (Mingers, 2001) where epistemology is a mix of historical materialism, Freudian psychoanalysis, and hermeneutics, and all knowledge must be put in historical, social, and situational context. On the other hand, in the IS field, although action research may appear as "limited" to its contextual knowledge and non-generalizable, knowledge acquired from this methodology can be shared with and used by other IS researchers for their benefit. For example, the IS practitioner working on a single case would be able to share valuable knowledge with his peers just like an airline pilot that discusses in his cockpit the tactics he used during a flight to avoid air turbulence over Paris. Finally, in my particular study, action research enable a "consultant" to work as a "researcher". The consulting process is a dynamic process based on a trust relationship between human beings. In the quest to improve the effectiveness of consulting assignments, consultants/researchers may seem to be valuable because they "live" organisational issues that restrain effectiveness in management consulting firms.

Although quantitative data may be used in AR, qualitative data enhances practice by developing the researcher's capacity to judge complex human behaviours in particular to bring

solutions forward. However, action researchers must continually validate their claims with their key participants (Bassey, 1990). In other words, one cannot assume anything about knowledge without subjecting that assumption to public scrutiny and approval to ensure that it approved by key participants (Bassey, 1990). My role at EI required that I have a holistic view of the context of my study, capture the conflict behaviours and contagion mechanisms of the participants, analyse the data expressed by the participants, and then propose change. Therefore, both the theory and practice of interpretation work simultaneously to understand the observed issue and phenomenon through the lived experience of the participants. For example, my objective was to co-design an upgraded version of the PMT, while tackling conflict behaviours toward the first version of the tool and conflict contagion mechanisms. Then, I selected a mix of interpretivist, constructivist, critical and praxis paradigms as my mode of inquiry. According to Baskerville and Wood-Harper (1996), AR is perfectly suitable post-positivist social scientific research method to study technology in its human context. Even if other methods for investigating technology in its natural context of daily use, Susman and Evered (1978) argue that AR distinguishes itself in its interventionist nature dedicated to knowledge development which is useful to both research and practice. Finally, according to Goldkuhl (2012), pragmatist paradigms has influenced IS research to a great extent, despite that paradigmatic foundations have not been fully acknowledged. For instance, Baskerville and Myers (2004) introduced an MIS Quarterly special issue on action research, in which they posit that paradigmatic basis for this research approach should be found in pragmatism. Indeed, the authors openly refer to the classical pragmatist philosophers (Pierce, James, Dewey and Mead) when stating this assumption.

2.2.5 Method

Despite that other research methods might have been used to analyse my research object in its natural context, the AR design of Susman and Evered (1978) was the most appropriate because of its interventionist and iterative approach dedicated to the development of knowledge useful to research and practice. For instance, the research design of Susman and Evered (1978) is one of the most AR methods used in social sciences and a form of CAR (Davison et al., 2004). Susman and Evered's (1978) approach first requires the establishment of a client-system infrastructure or research environment. Then, five identifiable phases are iterated: (1) diagnosing, which consists of identifying the firm issue to solve; (2) action planning of alternative solutions to solve the issue; (3) action taking corresponding to solutions selection;

(4) evaluating the consequences of solution actions; and (5) specifying learning and outcomes of general findings resulted from this cycle (see Figure 24).

It is most likely that the process of my AR will follow an iteration of many cycles corresponding to the main steps of the IT implementation phase. According to Baskerville (1999), IS research has led to some different approaches and methods, adapted from other disciplines such as sociology, psychology and natural sciences. The client-system infrastructure is the agreement between the researcher and Efficient Innovation Corporation, providing the authority to undertake the research. Focusing on the characteristics of my research field, and aiming to bridge the gap between research and practice, AR encompasses both action outcomes and research outcomes (Dick, 1995). AR considers that it is useless to investigate a real-world problem without working to propose a solution (Meissonier and Houzé, 2010; Lindgren et al., 2004). Since conflicts in organisations evolve, it justifies that process analysis is more adequate than static analysis (Jehn and Mannix, 2001). When my AR assignment started, I was not aware of any preconceived propositions that could have been formulated to assume the causes and state of the conflict that the firm was facing.

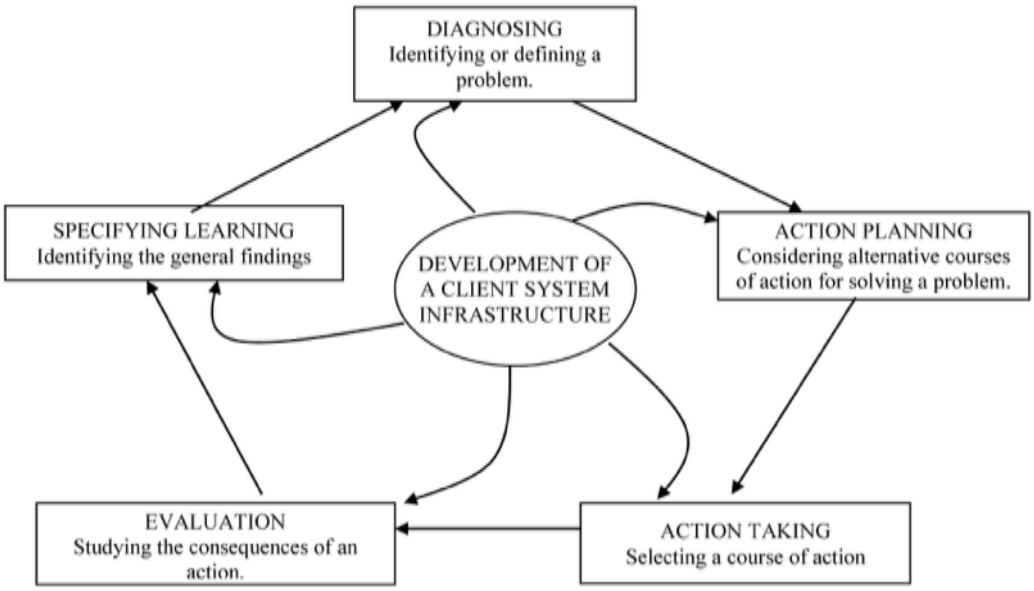


Figure 24: Canonical Action Research Cycle according to Susman and Evered (1978)

Starting with the identification of a problem or situation that calls for action, AR acts as a liberating agent of change, and is (Baskerville, 1999; DePoy and Gitlin, 1998; Susman and Evered, 1978):

(1) Cyclic: as iterative steps recur in a longitudinal time frame (38 months, in my case), generating know-how to result in further action;

(2) Participative: as employees and researchers collaborate in partnership as co-researchers, and where stakeholders are full participants in the research process or where practitioners serve both as subject and researcher, one refers to participative action research;

(3) Qualitative: operating more through verbal conversations than by numbers;

(4) Reflective: because critical feedback on the process is essential to each cycle, and is used in designing subsequent steps and actions;

(5) Responsive: as it reacts and adapts flexibly to the findings from each previous cycle.

For instance, at EI, it was interesting to tackle a single case delivering an illustrative story (Benbasat et al., 1987). This empirical field occurred to have a research configuration that permitted me to stimulate the project and observe how conflicts evolved. Accordingly, the DG agreed as for the relationship between the action researcher (myself) and the research participants (management consultants, managers, HR staff, administrative assistants) to avoid any potential conflicts over each party's role and ensure the quality of the research output. According to this agreement, I was expected to be a source of recommendations about the solution to the problem to be implemented. Moreover, the DG assisted me in the identification of appropriate participants and securing their agreement to be part of the research project. On the other hand, EI allowed me to use data collected for my academic research work.

Efficient Innovation Corporation, a firm that promotes and manage research projects, was interested in tackling IS project management from a research point of view, which resulted through hiring a researcher in information systems, is another motivation to use an action research methodology. Furthermore, EI wanted to develop such a project to enhance and diversify the skills and knowledge of its employees. In other words, it was expected that I exploit empirical data collected for my academic and publication activities, so practitioners and employees at EI can take advantage of the resulting experimentations and recommendations regarding IS project management. Nevertheless, several AR methods exist and provide a portfolio of different techniques used in IS research. For instance, Chiasson et al. (2009) argue in their article on the numerous forms by which the methodology has been used in IS. The authors make the distinction between the research-dominant approach and the problem-solving dominant approach (p. 39-41). The research-dominant approach consists on focusing on theoretical ideas that inform one or more problem-solving situations. According to the research-dominant approach, IS theories can inform the class of issues to which the firms investigated are confronted. Consequently, problem-solving interventions are used to confirm or invalidate the applicability of theory related to the practical problems analysed. Hence, some

comparisons could be made with the hypothetical deductive approach in positivist analysis. On the other hand, according to Meissonier and Houzé (2010), *"the problem-solving dominant approach could be viewed as more explorative in the sense that it focuses on insights that can be induced from problem-solving activities"*. Thus, after resolving the issue of the firm, the researcher uses the data issued from problem-solving activities to compare with existing IS theories, or to develop new theoretical knowledge. Therefore, my study at Efficient Innovation Corporation appears to follow both a problem-solving dominant and a research-dominant approach.

2.2.6 Research Ethical Considerations

The question of ethics in qualitative AR arises, and this for various scientific reasons. First, in qualitative research, both the researcher and his/her participants are present in the field. Therefore, there would be necessarily an intersubjective relation of proximity (Martineau, 2007). Research participants welcome the researcher, give him/her time and trust. Qualitative approaches are thus entirely built around a close relationship between the researcher and the participant (Caratini, 2004). Accordingly, it is important to emphasise that the quality of the relationship established between the researcher and the subjects is largely accountable of the validity of the "data" (Martineau, 2007; Caratini, 2004). Second, epistemologically speaking, qualitative research as a whole, calls for a certain "constructivist" posture in which knowledge is born of dialogue and knowledge co-construction taking into account the complex characteristics of human actors. Qualitative action research, with the very nature of its data sources (especially human subjects), and value that the researcher gives to what is being said or done, is a research crossed by ethical questions that go far beyond the mere establishment of an ethical plan. That said, ethical principles play an essential role in research with human participants. In my case, ethical approval aimed at protecting human participants from potential risks, such as disclosure of anonymity and confidentiality (Creswell, 2009). As such, the ethical risk plan of this action research project was approved and checked by both the director-general of Efficient Innovation Corporation and my PhD supervisor.

CHAPTER 3 - FINDINGS AND DISCUSSION

<table>
<tr><th>Introduction</th><th>Chapter 1 – Literature Review</th><th>Chapter 2 – Methodology & Research Design</th></tr>
<tr><td>. Research problem: Limited IS studies on contagion mechanisms between distinct IT projects.

. Research contract & field: CIFRE thesis at Efficient Innovation Corporation.</td><td>. User acceptance, resistance, conflicts, contagion, path dependence, and Inoculation.

. Theoretical discussion and development: Two conceptual models of IT conflict contagion, and Inoculation.</td><td>. Methodology used to apply the conceptual models developed in Chapter 1: Canonical Action Research.

. Research design used: Susman & Evered (1978)

. Empirical field: A French management consulting firm called Efficient Innovation Corporation.</td></tr>
<tr><th colspan="3">Chapter 3 – Findings & Discussion</th></tr>
<tr><td colspan="2">Findings
3 AR cycles:
Cycle 1: Socio-political conflicts & unexpected cause of resistance was blocking the new IT project.
Cycle 2: Ongoing conflicts toward another IT system were causing new IT project failure.
Cycle 3: Inoculation succeeded to « protect » positive attitudes and to « soften » negative ones.</td><td>Discussion
IT Conflict Contagion conceptual model explored cross-resistance influence effects between two distinct IT projects.
Inoculation-based IT training sessions were effective in protecting people with positive attitudes from a counter-altitudinal attack, and in adjusting negative attitudes in the desired attitudinal direction.</td></tr>
</table>

3.1 First Action Research Cycle

Cycle 1 (02/14 – 04/15, 14 months)
Objective: • Understanding the technical objectives of the PMT (Portfolio Management Tool) as for the reasons for which it was developed in the first place; • Identifying and solving resistance behaviours toward the PMT; • Developing a beta version of the tool; • Go / No Go decision to deploy the IT tool.
Key sources: • Academic literature on IS user resistance, acceptance, and conflicts; • Alpha (first) version of the PMT; • Existing technical documentation on the tool; • Extensive informal discussions with employees working at EI; • One brainstorming session involving both key partisans (n=3) and detractors (n=4); • One Workshop session involving both key partisans (n=3) and detractors (n=4); • "Delivery" meetings involving the key partisans and detractors as well as junior consultants as intended users of the PMT; • Nine semi-structured interviews with key employees working at EI; • One meeting with the DG to discuss on how to proceed with the AR.
Data analysis: During several sessions with key employees at EI, direct observations, verbal and non-verbal communications were noted.

3.1.1 Design (Cycle 1)

The first cycle (February 2014 – April 2015) at EI was to explore the existing decision support system, the PMT, to understand its technical characteristics, identify, then solve conflicts and resistance behaviours toward its first version. The purpose was to develop an upgraded (beta) version of the tool and make it available to use (deploy it) for all consultants working at the firm. Cycle one followed more a research-dominant approach (Chiasson et al., 2009) by using as a first source, the literature on IS implementation success factors (Hsiao-Lan et al., 2005; Hong and Kim, 2002; Markus et al., 2000a, 2000b; Davenport, 1998). As for **diagnosing**, point one: *Understanding the technical objectives or the PMT as for the reasons for which it was developed in the first place, and point two: Identifying and solving resistance behaviours toward the PMT*, were key activities through which I have deepened my understanding of the organisational problem. My aim was to investigate why the PMT was initially developed at Efficient Innovation Corporation, and then understand the algorithms behind it, who designed it and for which reasons.

In other words, I was required to explore the tool as an actual user to underline any technical issues or difficulties in using it. Except for the existing literature on IS acceptance, resistance and user conflicts, I also had access to the internal technical documentation (specifications) associated with the PMT. Since the tool was developed internally by two experienced consultants, the material associated with the PMT included guidelines and definitions on how and when the tool should be used. The technical specifications allowed me to summarise the intended objectives of the PMT as well as its functions, which helped me to communicate more easily and technically with key users – whether those who developed the tool or those who were intended to use it. Moreover, I participated as a participant observer in a consulting assignment (a real-case R&D portfolio management assignment) with three experienced consultants, "partisans" of the PMT. This assignment allowed me to observe the behaviour of the "partisan" consultants and to participate in the R&D project prioritisation using the tool, at a client firm (Bou Saba and Brouwers, 2016). The tool's first module consisted of an online questionnaire (see Figure 25) with both quantitative and qualitative questions submitted to each of the R&D project managers. The purpose of this module was to determine the eligibility of the R&D projects to a French public funding scheme, the Research Tax Credit (CIR).

Project identification

In order for this survey to be the most useful, please recall the first phase, at the very start of the project, when objectives, risks or uncertainties were still not clear.
In order to have a complete view over the project and answer the questionnaire, surround yourself with the right people and refer to the documentation associated to the project.

Before the project (at its start)

12.
Does the project benefit from public incentives to innovation or research?
*
Yes
No
Don't know
13.
Have you been working in partnership with external organizations (societies, industrials, suppliers, laboratories, CRO, ...)?
*
Formal collaboration (under contract)
Informal collaboration
No
14.
Please provide the name of the external organizations, and shortly describe the assigned tasks.
*
Write NA if you answered No to the previous question.
15.
The global technical objective of the project consists in:
*
A new product/process
An improvement of an existing product/process
None of the two
16.
What were the original targeted technical / technological objectives?
*
Specify the initially targeted improvements and technical or scientific performance to reach.
17.
At the beginning of the project, did it seem to be technically uncertain?
*
Presence of technical difficulties or uncertainties. No obvious solutions or doubts regarding the success of the solutions.
Yes
No
18.
Why was the project technically risky/difficult/uncertain?
*
19.
Several solutions/techniques were considered/studied to meet the project's objectives?
*
Yes
No
20.
Please outline the solution(s)/technique(s).

Figure 25: A Screenshot of the Online Questionnaire Sent to R&D Project Managers at the Client Firm

This scoring questionnaire consists of a set of criteria that govern R&D projects selection. Each project is given a score, which expresses the extent to which set the CIR eligibility requirements were met (see Figure 26).

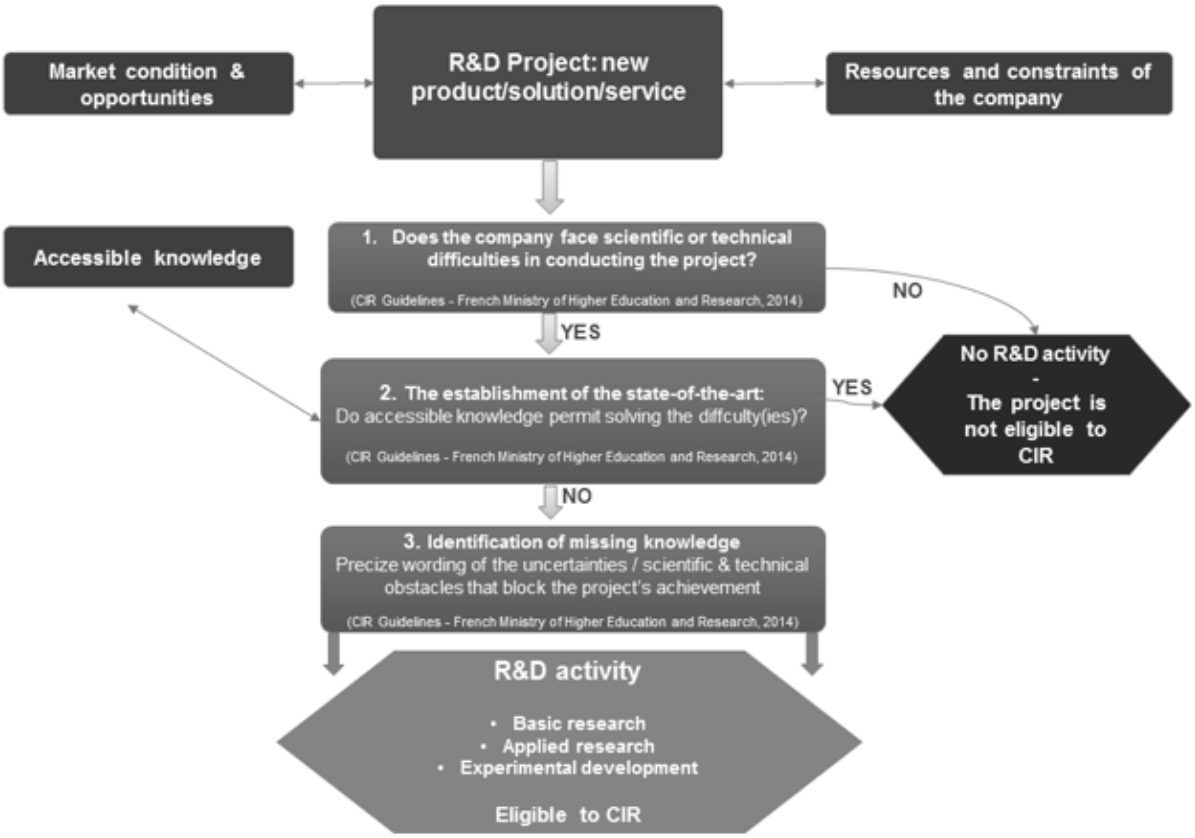


Figure 26: The French Research Tax Credit (CIR) Eligibility Criteria (Bou Saba and Brouwers, 2016)

In the context of French R&D programs, the research tax credit (CIR) covers 30% of all R&D costs up to €100 million, and 5% above this threshold. The decision to select projects in a portfolio is made with respect to their R&D characteristics. These projects must satisfy several criteria, like the ones defined by the Frascati Manual, to be eligible for the research tax credit. The following figure presents the three categories of R&D activities that are eligible to the CIR.

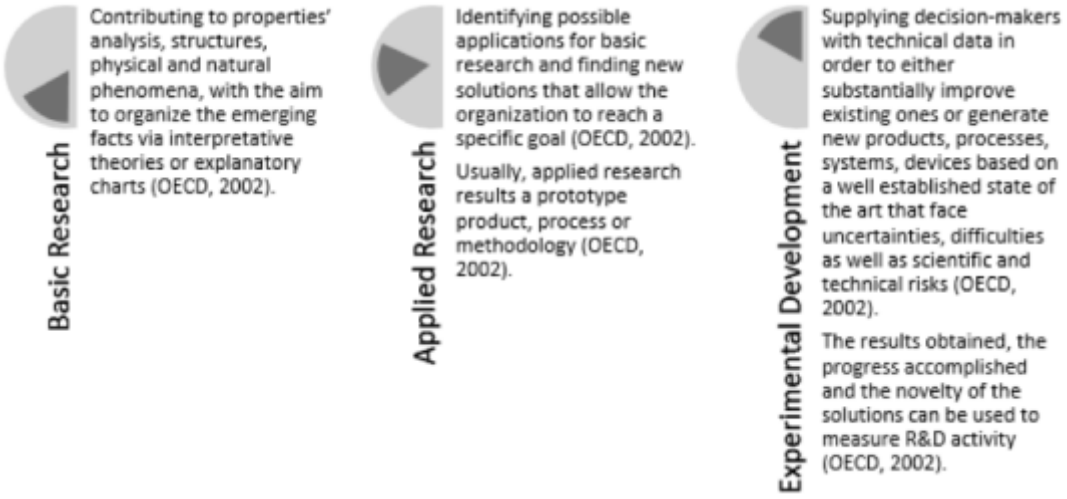


Figure 27: The Three R&D Activities Eligible to the French CIR (Bou Saba and Brouwers, 2016)

Eligible projects are those characterised by testing research hypotheses, addressing uncertainties, technical and scientific challenges. These uncertainties must be new and must have no previously known technical or scientific solutions. Moreover, the commercial novelty of the project/product or the simple fact that the solution is innovative or new is not enough to be eligible. Accordingly, the PMT consists of checklists, among others, in that they evaluate the degree to which each project fulfils certain eligibility requirements. The scoring algorithms use purely additive or multiplicative algorithm to summarise the eligibility criteria expressed by the Frascati Manual which are compiled by filling out a questionnaire. The tool's algorithm assigns a weight to be allocated to individual criterion to emphasise the importance of each. The scoring tool allocates the current value to each indicator deemed to be essential in R&D project selection (see Figure 28). The eligibility screening is expressed on three axes (novelty/new knowledge level, technical uncertainty level, and experimental development level). Nevertheless, the final eligibility of the project is made based on both the eligibility screening and the diagnosis of the consultants during the face-to-face interviews with the R&D managers at the client firm.

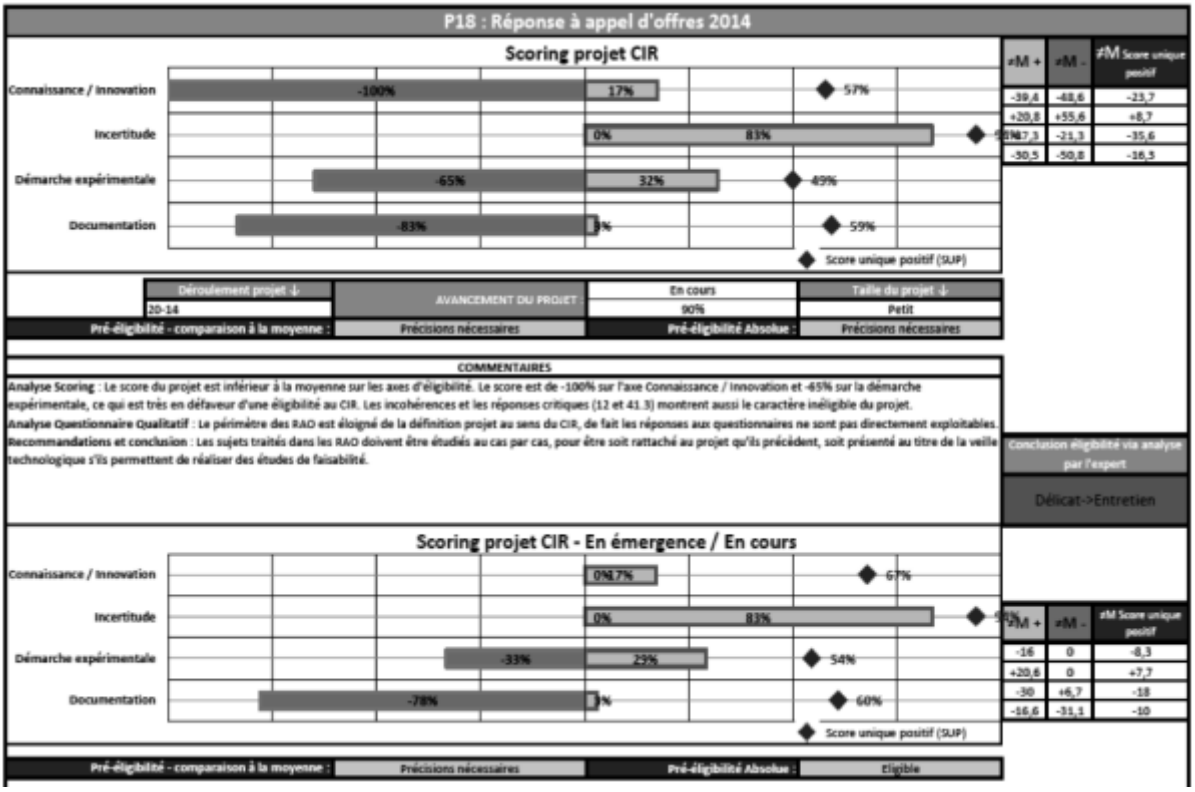


Figure 28: A Screenshot of one R&D project eligibility scoring issued by the alpha version of the PMT

Regarding **action planning**, once the assignment was over, I had a clearer view of the technical challenges that management consultants must face to provide their clients with an eligibility screening of R&D projects in their portfolio. The PMT seemed to facilitate the screening and prioritisation task of the consultants, making them more efficient and more rapid to establish scoring sheets than if they were to produce them mentally or manually (Bou Saba and Brouwers, 2016).

The DG had already identified the consultants that were concerned with the PMT implementation project before I joined the firm. He classified them into two groups – "Partisans" and "Detractors". The first group consists of consultants that developed the first version of PMT and were supporters of its use. The second group consists of consultants that were intended to use the tool but rejected it because of its technical issues. Among the other data sources that I used, a brainstorming session with Mr Dupont (R&D Project Portfolio Manager at EI), and the key consultants associated with the PMT project (three "partisans", four "detractors", and Mr. Dupont) was expected to classify conflict items in accordance with their influence level toward the PMT upgrade and implementation project. In line with my literature analysis, I focused on issues or concerns expressed toward the PMT regarding task-oriented

oriented conflicts. To address both the new design of the PMT and observe task-oriented conflicts among key users of the tool, the brainstorming session was deemed as the occasion to consider alternative courses of action for solving the organisational problem. As an animator of the first part of the brainstorming session that lasted three hours, key focus points were selected. The discussion points included subjects such as ergonomic enhancement of the tool, project selection algorithm verification by "detractors" group, user interface improvement, online questionnaire and eligibility criteria refining. The focus points were chosen based on the task-oriented concerns expressed at the beginning of the brainstorming session by the "detractors" which blocked them from using the tool and caused resistance behaviours toward it.

Then, in the second part of the brainstorming session, both the "partisans" and "detractors" group were asked to propose a plan of the necessary technical improvements which they trust very important before they start using the tool. This second part lasted two hours. To facilitate note-taking, Mr Dupont immediately captured in mind maps mutual improvement points, requirements and new design ideas from the two groups, during which I took advantage of the ongoing discussion to take notes and try to identify conflicts, whether task or socio-political oriented. After a final discussion between the participants and Mr Dupont, a consensus was made between the two groups as of the draft of the new process of the PMT (see Figure 29). Then, I proposed to meet again, two weeks later, for all the participants to start the necessary developments on the alpha version of the PMT.

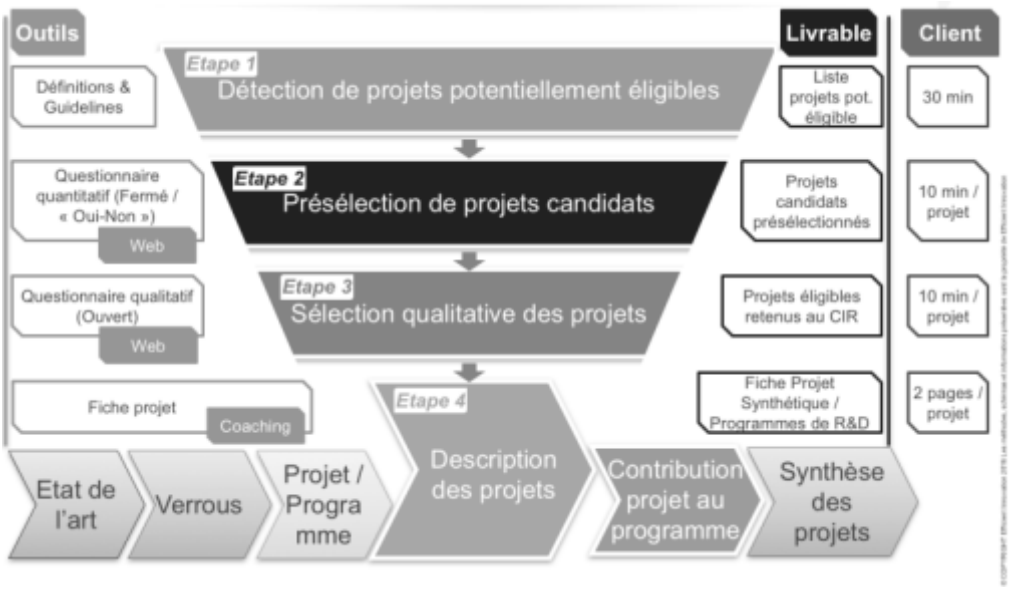


Figure 29: The New Process of R&D Project Portfolio Assignments

Everyone agreed to participate in a Workshop session two weeks later to put in action the improvement plan of the tool. Consequently, the brainstorming session was concluded. Regarding data analysis, I have noted both verbal and non-verbal communications that occurred during this meeting. The analysis was shared then discussed with EI's director-general.

As for **action taking**, the purpose was to design an upgraded (beta) version of the PMT based on the consensus that was made during the brainstorming session, then make a Go/No Go decision collaboratively with the director-general on whether we implement the PMT on a large scale. Accordingly, I organised a Workshop session two weeks after the brainstorming session. At the session, I was expected to propose a few software development methods to discuss them with the project team. The project team included the DG, Mr Dupont – the R&D Project Portfolio Manager, and the two developers (experienced consultants) of the first version of the tool. I was in charge of animating the Workshop session with the objective of accelerating the development and implementation of the upgraded version of the PMT. The DG had previously argued that no specific development method was necessary especially if the method itself would shift to be the objective instead of the PMT. According to the DG, he did not wish to "waste time" on finding the "right" method". Instead, he wanted to proceed with the development as soon as possible and limit the "waste" on internal resources regarding budget and time occurring in both R&D PPM assignments and the PMT project. Hence, I have identified the following three models of software development:

1. Rapid Application Development (RAD): a method that focuses on adaptability and adjustability in response to knowledge gained as the project progresses;
2. The Team Software Process (TSP): a method designed to assist teams of managers and engineers to organise software development projects that range in size from small to very large projects with more than half a million lines of code;
3. Test-Driven development (TDD): a method that relies on requirements that are transformed into very specific test cases, then the software is enhanced to pass the new tests.

Following the presentation of each of the three methods, the two experienced consultants in charge of the PMT development argued that they did not need any "heavy" method, and were afraid they would need specialised training to cope with the requirements of the method. More specifically, they stated that TSP and TDD were not adapted to the PMT project because they perceived them as *"new methods for a new software"*. In other words, the two consultants argued that the tool in its first version was practically finished, but it needed only a few modifications. The DG and Mr Dupont agreed with them and proposed to abandon TSP and TDD and adopt RAD because they perceived it as simple, and no prior training on the method was needed. The RAD model was presented in the IS literature as an IS design and implementation method for fast development and delivery with relatively low internal costs (Martin, 1992). Martin (1992) argues that RAD responds to the need to develop and implement effective business applications in shorter time periods and for less investment (p.1). More specifically, because of the dynamic nature of the PMT, during the same Workshop session, I have proposed the Dynamic Systems Development Method (DSDM) to the project team, a non-proprietary RAD method (see Figure 30) produced by a non-profit-making organisation of vendors, users and individuals associates of RAD (Martin, 1992).

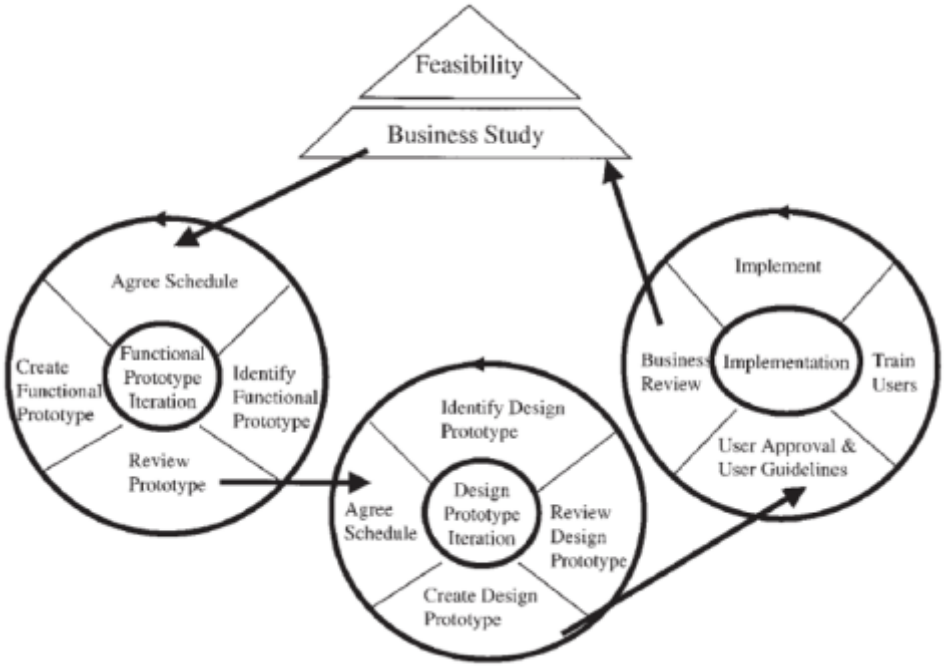


Figure 30: The DSDM Life Cycle (Martin, 1992)

According to Martin (1992), there are five stages of development within a DSDM:

1. Feasibility study: This stage is used to validate the suitability of an IT project for a RAD approach and to examine the feasibility of the project in business and technical terms;
2. Business study: This stage includes verification of the tool's high-level functionality and the main business entities affected;
3. Functional model iteration: This stage consists of designing and demonstrating the required functionalities using a functional prototype;
4. System design and build iteration: This phase is used to refine the functional prototype, especially to meet non-functional requirements;
5. Implementation: The implementation phase consists of the deployment and handover to users followed by a review of the project's success.

All the project team members including myself, agreed that additional motivations for using the DSDM method were the adequacy between the PMT project and the nine fundamental principles of the DSDM (Martin, 1991). Table 30 below illustrates the comparison I made in collaboration with the project team to confirm the adequacy.

DSDM principle	Description	Match with PMT	Project team discussions' outcome
1) Active User Involvement	DSDM is a user-centred approach that requires active involvement of users throughout the development project.	√√	Perfect match with the requirements of the PMT.
2) Empowered DSDM Team	The DSDM team must consist of both developers and users which both have the power to make key decisions.	√√	Perfect match with the specifications of the new version of the PMT.
3) Fast and Responsive Delivery	With DSDM, the team can deliver applications within agreed periods of time.	√√	Perfect match with the requirements of the PMT.
4) Fitness for Business Purpose	The new system may be rigorously engineered later if this is felt fit.	√	None of the project team members saw the need or will to launch a further upgrade workshop at the moment.
5) Iterative and Incremental Development	DSDM focuses on evolving a system by incremental steps – partial solutions may be delivered to fulfil an immediate business need, and later versions are developed based on users' feedback.	√	None of the project team members saw the need or will to launch a further upgrade workshop at the moment. Instead, the PMT should be upgraded on a "one-shot" basis.
6) Reversible Changes	With DSDM, one should have the ability to downgrade to a previous version of a system when needed.	√√	Perfect match with the specifications of the new version of the PMT. The first version will still be available to use by whom who wish to.
7) High-level Requirements	The new system's requirements shall be initially high with no need for further detailed investigations.	√√	Perfect match with the specifications of the new version of the PMT.
8) Integrated Testing	Testing shall be made incrementally along with the system's incremental development to ensure it is technically solid.	√√	Perfect match with the specifications of the new version of the PMT.
9) Collaborative and co-operative approach	DSDM projects require constant collaboration between sponsors, developers and users throughout the life of the project because low-level requirements are not fixed at the outset.	√√	Perfect match with the specifications of the new version of the PMT.

Table 30: Verification of the Adequacy between the DSDM and the PMT project

It is interesting to note that the PMT project had started before to its being chosen as a flagship RAD project. Since the development of the alpha version of the tool, the project was adapted to fit, in some ways, the RAD approach as described in the DSDM manual, according to the DG. Nevertheless, at its most simple level, change management occurring during an action research project, would be to ensure that new applications, ergonomic developments, algorithm modifications and learnings, are collaboratively authorised, tested, analysed, documented, and monitored by both the researcher and key research participants (Bassey, 1990). Failure to consider behavioural issues at EI such as conflicts may produce an IT tool

which will be rejected by those who and for whom it was designed and developed. Accordingly, the action taking process by which the IS design and implementation were to be undertaken consisted of a number specific factors to be taken into account, observed in the IS acceptance and resistance literature, including:

- Perceived threat: IT tools, in general, can represent a power threat by appearing to perform a task better than a human being, or an existential threat by appearing to be intended to replace individuals in their routine jobs;
- Individual acceptance: willingness to adapt to the new "digitalised" working environment with potential related changes in job function;
- User training: future PMT users must be provided with specifications, introductory and reference documentation, and tool instruction;
- Ease of use: future PMT users must have a minimum of dialogue with the new tool, need a method for correcting errors before it negatively affects their routine tasks, and tend to prefer IT tools which can be learned easily and quickly.

Consequently, two experienced consultants and "partisans" of the PMT that developed the first version of the PMT, worked solely on a part-time basis on the upgrade project, for two months using the DSDM as a plan throughout the project's duration. Moreover, the project included training sub-sessions for "detractors", and provided guidelines for future users of the PMT consisting of junior consultants mainly. During the sub-sessions, as an observer, I focused on concerns expressed toward the PMT as a potential way to identify task-oriented conflicts. I noted the comments, discussions and non-verbal attitudes of participants. The data analysis allowed me to identify several task-oriented conflicts between different categories of consultants at Efficient Innovation Corporation. Prototypes of the beta version of the PMT were periodically mailed to the "detractors" group for comment. Then, three user review sessions were held with the two developers, particularly around the end of the project. Four months after the start of the Workshop session, the PMT project went through a formal delivery and acceptance testing phase to PMT-opposing consultants, at which point I informed the DG of the beta version completion. Following the tool's approval of key participants in the Workshop session, the DG made the "Go" decision to deploy the PMT at EI on a large-scale, asking to urgently inform junior consultants of the deployment and to provide them with guidelines and training sessions on how to use it, marking the last phase of the DSDM. Figure 31 is a screenshot of a project's screening issued from the beta version of the PMT.

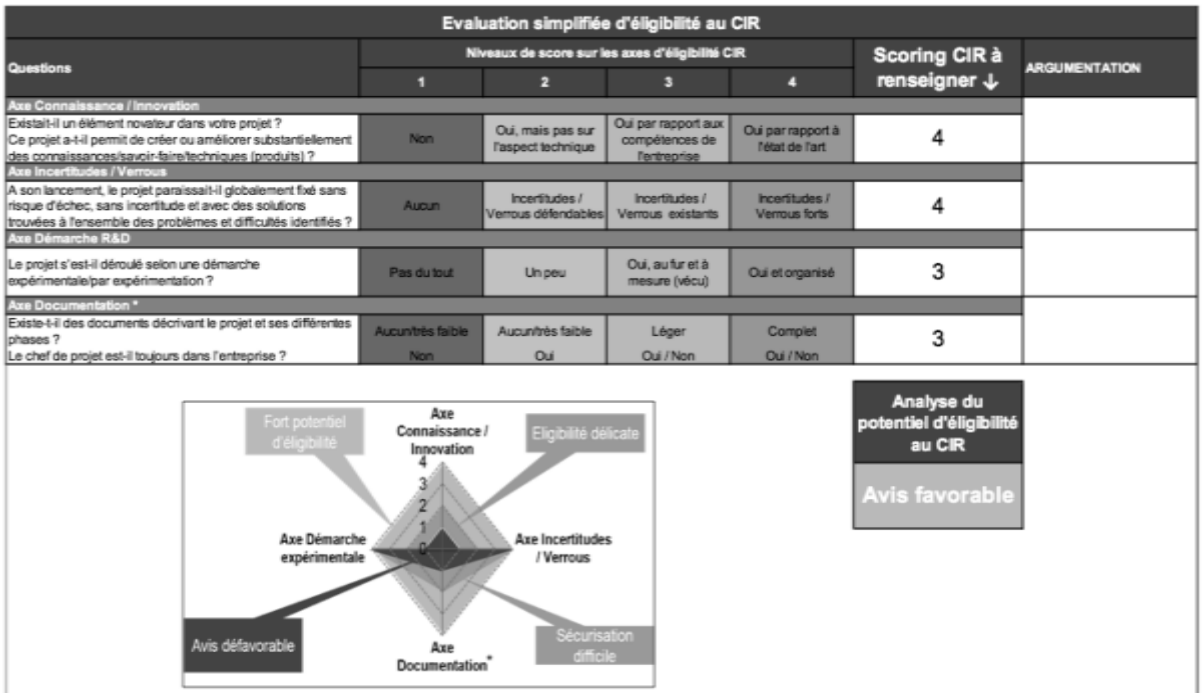


Figure 31: A Screenshot of an R&D Project Eligibility Screening Produced by the New PMT - Beta

Accordingly, as another **action taking**, I conducted nine semi-directive interviews one month later with key employees initially enrolled in the brainstorming and Workshop sessions as well with Mr Dupont, the R&D Project Portfolio Manager and main "partisan" of the IT project (see Table 31). The interviews were conducted in French, which is the mother tongue of the participants. Quotes used in the result section were translated from French to English only after the completion of the analysis.

Group of consultants	**Number**	**Category**
Experienced	4	"Detractors"
Junior	4	"Detractors"
Manager	1	"Partisans"
Total semi-structured interviews	9	

Table 31: Semi-directive interviews conducted in Cycle 1 at Efficient Innovation Corporation

The interview grid that I used was conceived in accordance with the key risk factors discussed in the IT implementation literature (Meissonier and Houzé, 2010; Markus et al.,

2000a, b; Rowe, 1999) (see Table 32[17]). Using this grid, I have asked the respondents to select the risk factor(s) that was (were) relevant to justify resistance toward the PMT project, and openly explain their choices. Each interview lasted around 40 minutes during which I have noted the main statements. To avoid potential biases of data interpretation, I have asked my respondents whether my interpretations seemed to be representative of their beliefs at the end of each interview.

Risk factor	**Research references**
Number of members of the team project	Barki and Hartwick, 2001; Rowe, 1999
Number of users	Barki and Hartwick, 2001; Schmidt et al., 2001
Lack of clarity of goals and objectives	Akkermans and Van Helden, 2002
Lack of resources	Schmidt et al., 2001; Lyytinen and Mathiassen, 1998
Cultural, functional or professional diversity of the team	Kankanhalli et al., 2006; Ewushi-Mensah, 1997
Poor quality software, documentation and training	Markus et al., 2000a, b; Bernard et al., 2004
Lack of expertise in project management	Akkermans and Van Helden, 2002
Lack of expertise in IT	Markus et al., 2000a, b; Lyytinen and Mathiassen, 1998
Excessive dependence on "key users"	Markus et al., 2000a, b
Internal conflict intensity	Kankanhalli et al., 2006; Barki and Hartwick, 2001; Markus et al., 2000a, b
Lack of inter-departmental cooperation and communication	Akkermans and Van Helden, 2002
Lack of clarity in the role definitions	Akkermans and Van Helden, 2002

Table 32: The List of Risk Factors used as an Interview Grid during Cycle 1

The interview, data collection, and data analysis phases lasted around four months, during which the development of the upgraded version was completed. I completed this data analysis by several informal meetings and discussions with the principal actors of EI. Field notes were taken during the interviews or immediately after leaving the research site each day in case of informal discussions. Such notes, for example, included observations about participants' nonverbal behaviours, what was occurring in my immediate surroundings, or what activities participants were engaging in.

[17] This table is adapted from Table A2 "Risk factors' list used during Cycle 1" in the article of Meissonier and Houzé (2010)

I partially used Nvivo software to synthesise codes and classify the data collected. Nvivo, a comprehensive qualitative data analysis software used by researchers to organise interviews, field notes and textual sources. The "nodes" (see Figure 32) in Nvivo software were compatible with the approaches of thematic analysis. More specifically, the nodes facilitated the task of establishing codes and emerging themes. Additionally, Nvivo made me feel more "creative" as it allowed me to be more focused on analysing unstructured data coming from different sources instead of performing lengthy manual coding. Hence, the software allowed me to perform effective and efficient coding which made data retrieval smoother. In other words, I succeeded to establish links between different paragraphs of statements among the various sources of data, and then retrieve the statements with less effort using the nodes. For instance, this task could have been hard if I was using manual coding. Finally, the most significant advantage for using Nvivo was being able to "digitalise" all the statements that I have been writing for the past three years on more than a hundred pieces of papers, and to keep them under one roof "safely". Accordingly, these statements may serve for future research purposes. Similarly, the software allowed me to reshape and organise coding and nodes structure easily and quickly when needed.

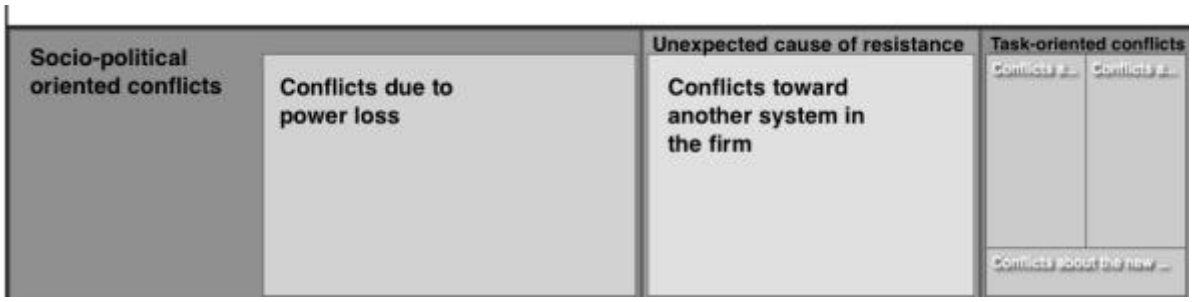


Figure 32: A Screenshot of Nvivo Software that shows the nodes' coding by the number of coding references

More precisely, the software saved me from "time-consuming" manual coding and boosted the accuracy and speed of the analysis process. However, the software was not used to analyse data, but rather to aid the analysis process (data management), which I must always remain in control of. The codes were created by mixing the thematic coding technique of Miles and Huberman (1984) and open coding (Strauss and Corbin, 1998) techniques. Strauss and Corbin (1988) authors argue that the researcher should make Data Reduction (p. 22), reducing and condensing data, and thereby beginning to seek meaning, as the study begins and continue throughout data collection. Data Display is another task that researchers should do to organise the assembly of information that permits conclusion drawing and action taking. According to

Miles and Huberman (1984), the most frequent form of display for qualitative data is narrative text. Finally, the same authors posit that researchers should do Conclusion Drawing/verification (p. 22). From the very start of data collection, the qualitative researcher should decide what information means, noting patterns, causal flows and propositions. However, conclusions may not be made until data collection is over (Miles and Huberman, 1984). Furthermore, conclusions shall be verified as the researcher proceeds. The interpretations of the researcher shall be tested for their plausibility, and their "confirmability" (validity). Additionally, my data analysis began with open coding, described as a procedure where *"the data are broken down into discrete parts, closely examined, compared for similarities and differences, and questions are asked about the phenomena reflected in the data"* (Strauss and Corbin, 1998, p.102). During open coding, the answers to the generated questions are sought in the data. These questions may generate working propositions that can be validated during further data collection (Strauss and Corbin, 1998).

During the interviews, I managed to ask both categories of employees, four experienced consultants on one side (the same employees that rejected the tool before I join the firm) and eight junior consultants on the other side (consisting mainly of recently hired consultants) to select the user resistance factors on the interview grid associated with the PMT project (see Table 32, p. 130). Each interview lasted around 40 minutes. Moreover, I used my written notes and memos to validate the main assumptions of my respondents at the end of each interview and reiterated my respondents' assumptions when necessary to assure that I captured their point of view of a particular circumstance or issue. Then, I asked my respondents to confirm that I have not disregarded any of their assumptions. The notes also included "off-the-record" data captured during informal discussions with the interviewees, which were also verified by repeating them in front of the respondents to make sure I have understood well their points. While transcribing major statements, my focus also included artefacts, facial expressions, body language analysis, pauses, sighs, stammering, and laughter. On the other hand, when data collection was over, I labelled blank sheets of paper with the respondents' pseudonyms and made a list of all the codes I had written on the interview transcripts. According to Chase (2003), the interpretive comments and codes of the researchers should be separated from the original transcripts before starting the analysis. Then, I have classified meaningful specific codes, and statements expressed in the interpretive comments, and have matched them with data collected from the interviews and informal discussions that support each of the classifications. Finally, I began writing my final analysis starting with the classifications that pervade the majority of the interviews and discussions.

3.1.2 Results (Cycle 1)

In terms of **evaluation**, Mr. Dupont held several "Delivery" meetings with all the consultants (25 in total, including the "partisans" and "detractors" group which participated in the brainstorming and Workshop session), that were often required to do R&D Project Selection assignments, to ask them to start using the new version of the PMT in their very next assignments. Accordingly, I participated in the meetings as an observer and took notes on how employees reacted to this information. During one of these meetings, the experienced consultants that rejected the alpha version of the PMT stated that the tool's upgrade was successful and fitted well with their assignments' requirements. Moreover, the two developers took great pride in delivering what was seen as a critical replacement of the old version of the PMT on time with the consent and in collaboration with the "detractors" group. Below are the findings with respect to the identified conflict categories.

- **Conflicts about the new professional skills required**

During another "Delivery" meeting, although they have recently accepted the new version of the tool, two experienced consultants and "detractors" have argued that too much documentation and complicated guidelines were produced on the project, and that they were having troubles finding the "PDF" guidelines in the firm's online data-sharing platform (NetSync) in which the documents were stored. Additionally, they added that it would be impossible to use the tool this fast, before fixing the guidelines issue, respectively stating the following:

> *"Under the category of R&D Selection Tools on NetSync, there are hundreds of folders and subfolders and sub-sub-folders, with a million versions of the guidelines! It's a gas industry! (an experienced consultant, LMS member).*

> *"I agree, impossible to find the right tutorials that detail the selection process!" (an experienced consultant, LMS member).*

> *"Neither I, neither the juniors, are able to use the PMT this fast. We need to understand properly its functioning! We cannot even find the tutorials on NetSync!" (an experienced consultant, LMS member).*

These statements have gradually led other meeting participants to state other technical issues that blocked the imminent possibility of using the PMT and therefore engaging in the same active resistance behaviours as their peers. This first observation was consistent with the assumption of Jehn et al., (2013), Li and Hambrick (2005), Jehn and Chatman (2000), Jehn et al. (2006, 2010), Rispens et al., (2007) and Pruitt (1995), that is, when increasing numbers of members of a team behave in a conflictual manner, an increasing number of members are also likely to agree and potentially engage in conflict behaviours themselves.

- **Conflicts about the new tasks that employees should fulfil**

One experienced "detractor" consultant that participated in the Workshop session argued that he may use the online questionnaire module of the tool, and only this, disregarding the new process of R&D PPM assignments as a whole package of modules. Another "detractor" that participated in the Workshop session agreed with him arguing that the entire R&D PPM process has been impacted by the PMT that is, its users are obliged to perform more tasks than before causing inefficiency in assignments. These experienced consultants stated the following:

> *"I think I will only use the questionnaire module of the tool as I find it interesting to help me go faster in my R&D PPM analysis. As for the rest of the process, I actually have my own analysis support tool that I developed when I used to work at Company X" (an experienced consultant, LMS member).*

> *"Following all the latest modifications we have brought to the tool, it now became very heavy to use. I mean, aren't we looking for efficiency in here? With the long process that the PMT impose, I'm sure we are losing efficiency because of the time needed to execute all the tasks required!" (an experienced consultant, member of the "North" subsidiary).*

Then, another experienced consultant threatened to stop doing R&D PPM assignments if Mr Dupont insisted and forced them to use the tool. At this moment, the resistance behaviour had shifted from being "active" to being "aggressive", in the sense of the type of resistance stated by Coetse (1999). Thus, Mr Dupont decided to stop the meeting with the experienced consultants with no consensus made on the tool. Then he held another "Delivery meeting", but this time with eight junior consultants (four in Paris and four in Montpellier). During the

meeting, Mr Dupont exposed the technical specifications of the PMT and its advantages in the context of R&D PPM assignments. Then, he asked the group of junior consultants present at the meeting to read the guidelines made on the tool, to make a series of tests, and then to come back to him with improvement feedback. Most of the junior consultants refused to do so through passive resistance behaviours, arguing that they did not have time for this because they were fully booked with other assignments. They also added that they did not think the tool would be useful in their tasks. As a consequence, Mr Dupont decided to stop the meeting with no consensus made on the tool with this group neither.

Accordingly, six months after I started my action research, the "conflicting situation" got worse. The interaction made at EI in an attempt to solve the organisational problem which included several meetings, brainstorming, training and Workshop sessions, appeared as a failure. In other words, despite that the "detractor" group participated in all the "tool's improvement" sessions and although the group later agreed on the modifications made, the "detractors" eventually reinforced their "conflicting positions". At this moment of the action research, I decided to investigate beyond the "expressed" task-oriented conflicts and focus on socio-political oriented conflicts that may be causing IT implementation failure. Moreover, during informal discussions with the junior consultants right after the meeting, many of them told me that Mr Dupont should stop *"wasting his time and energy on developing such systems because no one will ever use them, just like other complicated tools at EI"*. Moreover, two junior consultants stated the following, respectively:

> *"You know, this meeting reminded me of the ERP, Dropbox, Skype, etc. etc. at Efficient. Consultants here actually complain about all IT system at the firm. It's funny!" (a junior consultant, "LMS" member).*

> *"It isn't the first time I see my colleagues nagging about the PMT. I trust there must have serious reasons why they don't want to use it. But this will be soon forgotten. The end of the month is near and they will soon start considering filling their time sheets on the ERP. Ha-ha!" (a junior consultant, "LMS" member).*

At the moment, I did not understand why these junior consultants mentioned the ERP while I informally asked them why did they reject the proposition of Mr Dupont to test the PMT. Nevertheless, at that stage, I decided to disregard the references made to the ERP, as I

assumed that it was not rational of them to do so. That said, I added them to my list of PMT "detractors". Table 33 below illustrates the updated categories of PMT "detractors".

Group of consultants	Number	Category
Experienced	4	"Detractors"
Junior	8	"Detractors"
Experienced	3	"Partisans"
Managers (incl. DG)	2	"Partisans"

Table 33: Groups of Employees Involved in the Conflict Toward the PMT after the Workshop session

Additional discussions with the DG encouraged me not to consider these task-oriented conflicts as sufficient causes for the PMT abortion, that is, several questions remained without answers:

- First, a new challenge for me was to understand why have the experienced consultants group continued to reject the PMT, while they actively participated in its upgrade?
- Second, why the rejection comments were not being focused on proposing solutions to solve the new specific issues (e.g., simplifying guidelines, asking for managers to liberate some time for junior consultants to test the PMT, etc.) instead of rejecting the whole project?
- Third, why junior consultants that were not initially concerned with the first version of the PMT resisted the second version of the tool?

To answer these questions, I have reviewed the IS literature and looked for academic articles in which the authors expose socio-political oriented conflicts as the main cause for IT implementation failure. The purpose was to prepare a plan for identifying and solving socio-political oriented conflicts that may be causing the rejection of the PMT. Five semi-structured interviews and informal discussions allowed me to grasp that what was perceived as a task conflict was hiding a conflict of power loss between the PMT partisans and detractors. Moreover, the data collected revealed that a task oriented conflict between Mr Dupont and the DG was hiding a socio-political oriented conflict which was not identified before (Bou Saba and Meissonier, 2016). The DG accepted to proceed with the AR. He gave me a "carte blanche" to use the research methodology that I would judge as the most relevant to tackle and solve the organisational issue. Despite the failure of the first attempt to solve the organisational problem, the sessions organised (brainstorming, Workshop, final meetings, etc.) allowed me to identify

two main categories of employees opposed to the IT project: four experienced consultants on one side (the same employees that rejected the tool before I join the firm) and eight junior consultants on the other side (consisting mainly of recently hired consultants).

Five categories (causes) of conflicts unfolded from the semi-structured interviews and were coded (see Figure 33 and Table 34) and aggregated according to the five sub-dimensions of the task vs socio-political oriented conflict dialectic.

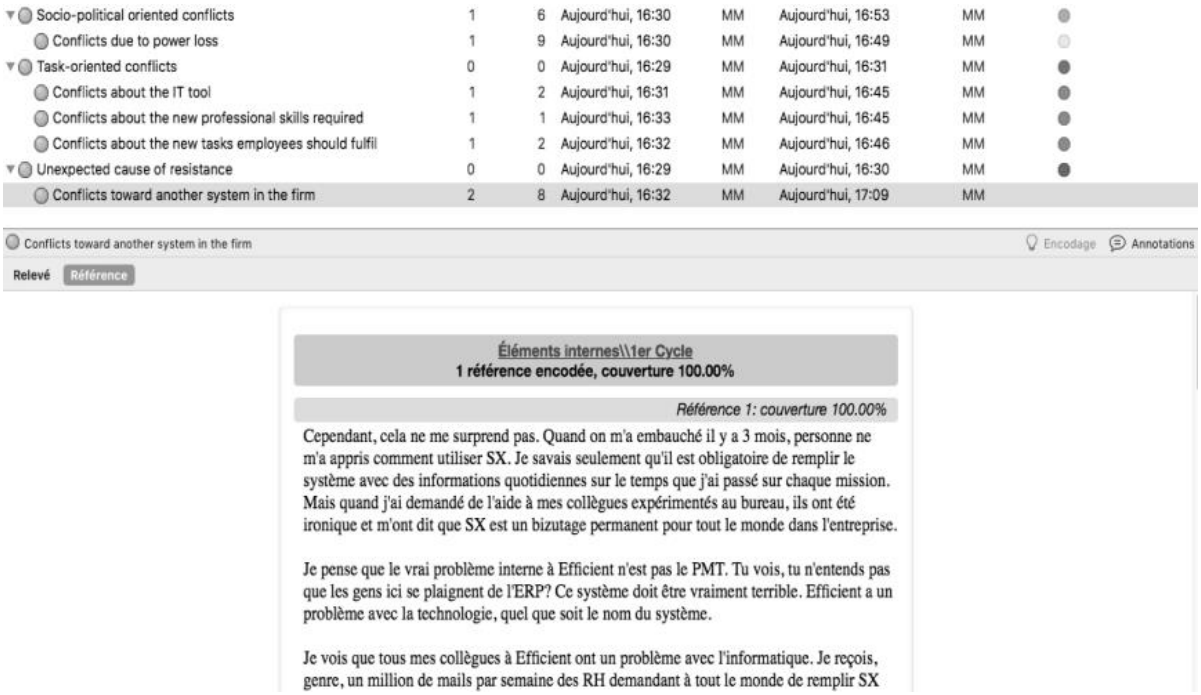


Figure 33: A Screenshot of the Coding Process Performed using Nvivo

Following the data analysis made during the first cycle and during the post-Workshop session meetings, allowed, as **specifying learning**, the pinpointing of two groups of consultants opposed to the PMT project on one side, and two groups of consultants in favour of the PMT project on the other side. The "partisans" group (five employees) was composed of experienced management consultants all based in Montpellier office, EI's headquarters, of which most had graduated from engineering schools, and had no experience in management consulting before being employed at the firm. Three individuals of the "partisans" group were members of the "virtual" LMS team. Their activity was focused on R&D financing in general and on conducting R&D PPM assignments in particular in the "Province" regions (outside Paris) for large enterprises. The PMT project was the initiative of the manager of this group (also an LMS member), Mr Dupont, based in Montpellier, a Business School graduate, and expectations concerning consulting efficiency were shared by the rest of the group. On the other hand, the

"detractors" group consisted of twelve consultants mostly based in Paris office, and most of which had graduated from engineering schools. Five junior consultants of this group were recently hired, and recent engineering graduates also holding post-graduate degrees in Business Management. Junior consultants at EI are required to be polyvalent and acquire several skills associated with the activities of the firm. The remaining four persons consisted mainly of experienced consultants that had prior management consulting experiences at large-size and "famous" competitor firms. All four were members of LMS at EI. Their activities consisted of conducting R&D PPM assignments and managing "operational" junior consultants. These four were considered to have unique R&D management skills at EI because of their extensive experience in dealing with complex project portfolios of large groups based in the French capital. Accordingly, their approbation was considered as a key prerequisite to any PMT implementation or new process associated with the R&D PPM activity at the firm. Table 34 below shows the types and categories of conflicts identified at the end of the first cycle.

In Cycle 1, I have identified socio-political oriented conflicts manifested by four experienced consultants and two managers, all members of the "detractors" group. However, the data collected also revealed an unexpected cause of resistance, but this time toward an entirely different IT system at Efficient Innovation Corporation, that is, the firm's Enterprise Resource Planning (ERP) system, called "SX". Next, I detail these categories and provide insight as for the main statements expressed by employees in line with the identified conflicts.

Conflict orientations	**Conflict types**	**Categories (causes) of conflicts**	**Codes used during data analysis***	**Group of employees**
Task-oriented conflicts	Conflicts about the IT tool	PMT's ergonomics; PMT's algorithm; PMT's user interface; R&D PPM's process	PMT design issues; uneasy-to-use application; lack of user friendliness; non-appropriateness to user needs; poor algorithm; unreliable new R&D project process; time-consuming new process; unnecessary additional tasks; incompatibilities with existing R&D selection methods.	Experienced consultants
	Conflicts about the new tasks employees should fulfil			
	Conflicts about the new professional skills required	R&D project selection guidelines and documentation	Complicated-to-understand guidelines; non-instinctive use of the PMT; time and resource-consuming training sessions; access-to-documentation difficulties.	Both experienced and junior consultants
Unexpected cause of resistance	Conflicts toward another IT system in the firm	Prior and ongoing conflicts toward the company's ERP	References to ERP/SX; negative prior experiences with IT; problem with technology.	Junior consultants
Socio-political conflicts	Conflicts due to power loss	Prior work experience at large-size "famous" consulting firms that do not use a PMT	PMT non-need; showing off; individual capability, large groups assignments vs small firms' assignments, mockery.	Experienced consultants and managers
		PMT as a way to control and reduce the autonomy of consultants; PMT as a way to impose the manager's best practices on consultants; PMT as a way to homogenise the R&D selection outcome of several consultants working on an assignment	Outcome homogenization; best practices imposition; lack of skills; autonomy loss; constraining administrative processes to be followed.	Experienced consultants and managers

*****The codes were created by mixing the thematic coding (Miles and Huberman, 1984) and open coding (Strauss and Corbin, 1998) techniques.

Table 34: Types and Categories of Conflicts Identified at the End of the First Cycle

- **Conflicts due to autonomy and power loss**

Conflicts due to autonomy and power loss (among others) were identified through the prism of the respondents' words and actions, noted during the semi-directive interviews with two junior consultants and two experienced consultants, all "members" of the "detractors" group. These conflicts were also comprehended through an understanding of visible elements such as artefacts and behaviours. First, the analysis of inter-groups conflicts (Paris group vs Montpellier group) at EI revealed that the members of the Paris group succeeded in forming internal coalitions to "defend" their practices and autonomy. Accordingly, the four interviewed experienced consultants had one perception in common, which was seeing the PMT poorly, that is, the tool was developed by employees that had their own best practices that were adapted to the needs of their clients. However, in Paris, the interviewed consultants argued that they did not need the tool, neither did their clients. These assumptions were essentially formulated by the individuals, detractors of the PMT project, during the interviews. For instance, when I asked two of the four experienced consultants to elaborate on the reasons why they picked *"Cultural, functional or professional diversity of the team"* as a cause for rejecting the PMT, they stated the following:

> *"Mr Dupont has extraordinary capabilities in doing interesting things and methods, such as the PMT. But those things aren't useful for us. We don't need them!" (an experienced consultant, LMS member).*

The same employee later stated the following during an informal discussion:

> *"You see, here in Paris, we have always succeeded in doing very complicated R&D PPM assignments without the help of no one. In here, we really don't need any help of this nature." (an experienced consultant, LMS member).*

The other experienced consultant that I interviewed confirmed his colleague's opinion stating the following:

> *"When I work with my colleagues here in Paris on assignments that we have sold, it is really fun and very professional. It's not however the case when*

I have to produce assignments sold by Mr Dupont in the south or wherever" (an experienced consultant, LMS member).

After finishing the interview, the same employee stated the following:

"I must have done 3 or 4 assignments with the consultants in Montpellier. They are brilliant, very skilled. There's one thing I do not understand though, how do they find time to develop a decision support system? Maybe in the south, the day has 32 hours instead of 24, you know with the beach and everything, Ha-Ha!" (an experienced consultant, LMS member).

Moreover, during the interviews with the other two experienced consultants in Paris which were members of the "North" group, my observations were that because they had prior management consulting at "big" competitor firms, seemed to also form a coalition of their own, sharing the methods and best practices that they brought from their previous employers. For instance, they stated the following:

"I did not have a decision support system when I used to work at company X. We did not have any assignment efficiency problem. We were more than 200 consultants! The advantage there was my business card. When clients saw the logo of my firm, they were reassured I would do an excellent job. However, the advantage at EI is that it's culture is less rigid than where I used to work. Here, I fix my own way of doing with no one telling me how, where and when. It's a playground!" (an experienced consultant, member of the "North" subsidiary).

"You see, I am capable of analysing a hundred R&D projects in just a day. I always did, especially when I used to work at X. I'm not sure how the others (partisans) proceed with the PMT, but I do not need any help to get the job done! I have all the tools needed for that, and it's mainly right here, in my brain!" (an experienced consultant, member of the "North" subsidiary).

Accordingly, the data collected revealed at this stage that the PMT was perceived by the experienced consultants in Paris (LMS and North subsidiaries) as putting into question the

skills of the experienced consultants in Paris. More specifically, these consultants represented a key competence asset for EI, that is, they were not just "standard" employees that could be replaced by other consultants from other subsidiaries. These experienced employees were able to perform very complicated "missions" using their methods or best practices that they have acquired from working previously at other "famous" consulting firms, well-known in using very structured consulting methodologies. Therefore, with time, these consultants had gained strong independence in the way they organised their work. They did not want to be "governed" by methods that were not their own.

Moreover, during the semi-structured interview that I made with the R&D PPM assignments at EI, Mr Dupont, the data collected revealed that power conflicts due to the PMT project are classified as "conflicts of power gain" about the use of the tool as a way to have control over its users. In my case, the PMT was used by Mr Dupont as a way to impose his methods on the users via the tool. In other words, the PMT was conceived on the basis of the R&D selection methodology and algorithm that was imagined by the R&D PPM manager. Hence, if employees would accept to use the tool, they would indirectly accept the R&D selection methodology of Mr Dupont. This way, the manager would be capable of imposing his point of view regarding the best practices for performing R&D selection assignments. Eventually, if Mr Dupont decides to modify his methodology, all the users of the tool would indirectly follow the adaptation because they are users of the PMT, and are therefore dependent on its deliverables. Users' dependency on the tool is the key, according to Mr Dupont, to "homogenise" the tasks, and therefore the outcome, of several consultants using the PMT. The following statements of Mr Dupont confirmed this observation:

> *"The assigned consultants, both junior and experienced, sometimes have conflicting methods or way of doing to manage R&D portfolios. Regardless of their expertise and skills in the subject, the consultants may have different opinions in terms of the eligibility level of their client's projects. Therefore, the PMT, in this case, comes as a solution to homogenise the interpretations of multiple consultants working for the same client" (R&D PPM manager at EI, "LMS" member).*

Whenever the PMT defines which project is eligible and which is not, it would assure that all the consultants would adapt to the same reasoning and results of the PMT's project selection. During further informal discussions with Mr Dupont, he stated that he was worried

about the lack of skills, knowledge and expertise of some consultants in the firm coming from diverse academic backgrounds. At this moment, a socio-political oriented conflict seemed to hide a task-oriented conflict:

> *"A decision support tool can homogenise and converge the multiple interpretations of the consultants assigned to an R&D project portfolio management task, and therefore, the very same tool can cover their lack of required technical skills to fulfil the assignment" (R&D PPM manager at EI, "LMS" member).*

Moreover, during informal discussions with Mr Dupont, he argued that the DG never "allowed" him to select whoever he wants at EI to produce the assignments that he sells. He added that to achieve the "full potential" of his commercial activities, the DG should give him the authority to choose any consultant of the 75 who work in the firm, regardless of their belonging to other subsidiaries or managers, and irrespective of their educational background or expertise. Accordingly, Mr Dupont stated the following:

> *"The DG never allowed me to select the consultants that I judge the best for producing the missions that I sell. There's more than 70 consultants at EI! Why do I have to choose between 3 or 4 only? With the PMT, I can unite several consultants, whether juniors or seniors, biologists or physicists and make them work together on an R&D assignment for a client firm that do projects in the field of musicology!" (R&D PPM manager at EI, "LMS" member).*

On the other hand, during a previous interview with an experienced consultant from the "detractors" group, the employee checked two additional factors from the interview grid for rejecting the PMT. These were *"Internal conflict intensity"* and *"Lack of expertise in project management"*. As for the first factor, the same employee argued that Mr Dupont and the DG have always been in conflict. He stated that the ongoing conflicts between them did not encourage him to adopt the tool because he was sure that the DG would not agree on any of Mr Dupont's propositions in terms of strategy. Therefore, these causes of resistance behaviours were out of my AR project's perimeter.

- **Unexpected Cause of Resistance**

On the other hand, the interviews with the four junior consultants revealed an unexpected cause of resistance toward a different IT system at Efficient Innovation Corporation, that is, the firm's Enterprise Resource Planning (ERP) system, called "SX". When I asked these consultants to select on the interview grid the factor(s) for which they have rejected the PMT, two of them picked *"Lack of inter-departmental cooperation and communication"*, and the other two chose *"Internal conflict intensity"*, explaining their choices with the following statements:

> *"Honestly, I have never heard of the PMT before the last meeting with Mr. Dupont. I did not know it existed! One cannot expect everyone to use a tool in a 24-hour delay without prior discussions and training sessions!" (a junior consultant, "LMS" member).*

The same employee later added the following:

> *"…It doesn't surprise me though. When I got hired 3 months ago, no one taught me how to use SX. I only knew that it is obligatory to fill up the system with daily information on how much time I spend working on each assignment. But when I asked my experienced colleagues in the office for help, they laughed and told me that SX is a permanent hazing for everyone in the firm" (a junior consultant, "LMS" member).*

The other junior consultant stated the following:

> *"I really think there's a problem at Efficient Innovation. Right in the middle of an assignment, the manager asks me to use a new methodology I never knew it existed. The problem is there are 20 other available methodologies that I discovered on the internal Wiki. But no one is aware of their existence. We have clearly a communication problem at Efficient!" (a junior consultant, "LMS" member).*

The other two junior consultants stated that the firm has a "problem" in dealing with IT systems stating the following:

> *"I see that all my colleagues here have a problem in dealing with IT systems at Efficient. I receive like a million email each week from HR telling everyone to fill up the system before the end of the month. Then, I hear my colleagues next to me yelling: oh, I don't have time for this SX Sh-T! You see, it doesn't get me motivated to use either systems" (a junior consultant, "LMS" member).*

> *"I think the real internal problem at Efficient is not the PMT. I mean, aren't you hearing people here complaining about the ERP? This system must be terrible. Efficient has a problem with technology regardless of what's the IT system is called" (a junior consultant, "LMS" member).*

Accordingly, an unexpected cause of conflicts emerged during data collection, that is, an "external" cause of ongoing resistance toward another IT system in the firm may have been negatively impacting the PMT project. In other words, the data collected revealed that the company had been witnessing a "problematic" situation toward its ERP, which had been somehow influencing the distinct PMT in general and the behaviour of junior consultants toward the PMT project in particular. The unexpected conflict situation was consistent with prior studies that showed that previous failing projects of IS integration were observed as contributing to a bad image of ERP projects (Nelson, 2007; Markus et al., 2000; Davenport, 1998). These studies mainly observed resistance behaviours between successive and similar IT projects in terms of functionalities. However, in my case, the two IT systems were far regarding objectives, design and functionalities. Indeed, the ERP was a "ready-to-use" enterprise system for internal administrative purposes, whereas the PMT was an Excel-based application that aims to help consultants with R&D PPM assignments. Moreover, the ERP project started in 2009, five years before the PMT project. It had an entirely different budget allocation, duration, and project team. When the ERP project started, an external technical support team intervened at EI to implement it and perform training to key consultants, that were in turn supposed to train the remaining consultants at EI.

I held a meeting with the DG to update him with my latest observations and discuss an action plan to tackle the new conflicting situation at EI. More precisely, the prime objective of the meeting was to expose the negative statements of the employees that rejected the upgraded version PMT after having participated actively in its improvement and having shown

satisfaction toward the new version. Accordingly, when I shared with the DG the statements of few experienced consultants that reveal cultural and power conflicts, he justified their statements saying the following:

> *"When we ask our consultants to do R&D PPM assignments for multinational firms such as Airbus or Renault, we know that very specific skills are required regarding their in-depth technical understanding of highly technological projects, capacity to deal with scientific projects that may be different than their initial educational background, and ability to perform instant and on-site preliminary R&D Portfolio screening in terms of eligibility to the CIR" (the Director-general of EI).*

The DG later added that such job requires highly-intellectual, yet very operational individuals to be on the field. Accordingly, in the eyes of the DG, the four experienced consultants represented a rare workforce on the professional innovation management market. On the other hand, when I asked the DG to tell me his personal opinion as for the reason why these consultants still did not want to use the PMT, or why some suggested to use it partially, although they actively participated in its upgrade, he said the following:

> *"Despite the complexity of the tasks they perform, these consultants manage to produce great "missions". I personally think, that if they do not want to use a decision support system, that is because they do not really need it" (the Director-general of EI).*

The DG later added the following:

> *Take for example small R&D eligibility screening assignments at EI for SME clients. The assigned consultants must deal with 1, 2 or 3 R&D projects which don't need additional support from a PMT because the task is relatively simple. Similarly, if the task of managing large and complex R&D PPM assignments is perceived as simple for some consultants, I would not expect from them to use a PMT neither. Therefore, I trust in my consultants' wisdom to judge whether they need a DSS or not, partially or completely" (the Director-general of EI).*

And the following:

> *"… that said, I would have loved to see my consultants actually using the PMT. I have always been supportive in my efforts to convince them to use it and have never told them what I've just told you. Even if I do not agree with Mr Dupont on a lot of things, I think he may be right that the PMT could homogenize the tasks for consultants from diverse backgrounds" (the Director-general of EI).*

The DG's statements were a turning point for me. After hearing what he said, I thought to myself that he hired me to solve the PMT-conflict organisational problem. A year after I started my investigation at EI, after several upgrade workshops, brainstorming and training sessions, as well as extensive meetings to deploy the tool, it was revealed that the very same person that was "behind" the PMT project, EI's director-general, actually thought that it was "normal" and acceptable for some consultants not to use the tool. During further informal discussions with him, he argued that despite failing to solve the conflicts toward the tool, I succeeded in inducing interactions at EI that resulted in designing a better version of the PMT, one that *"is co-designed by a mix of the best and highly-skilled, as well as the most experienced consultants working at the firm"*. Moreover, the DG suggested to make a consensus with the experienced consultants from the "detractors" group stating the following:

> *"Now that you have succeeded in upgrading the tool in accordance with the wishes of the consultants based in Paris, I trust that they are now less resistant toward the idea to use it, even partially. Now it's the right time to make a consensus with them regardless of what Mr Dupont thinks" (the Director-general of EI).*

The DG added the following:

> *"For those who judge that they don't need the PMT in their assignments, we should respect their choice and leave them alone. For those who need only a part of the PMT, then let it be! In Montpellier, all is good; everyone wants to use the PMT. As for Juniors, they have no choice but to use it when they are required to do so. Voila, problem solved" (the Director-general of EI).*

He added that having such PMT on premise would lead to more sales because clients appreciate IT-enabled decision support systems that engage both themselves and consultants in the portfolio management process. A PMT is perceived as supporting more "scientific-based" decision making (via computer assisted decision making), which is an added-value in the eyes of project managers at client firms:

> *"Now, I'm capable of selling the idea to costumers, that Efficient Innovation Corporation is the only firm in France that engaged a PhD researcher through an internal R&D project, to design and develop a decision support system for selecting CIR-eligible projects in an R&D portfolio. Research-assisted methodologies are well appreciated by clients, and therefore I'm confident I will double my sales because of this!" (the Director-general of EI).*

Therefore, the data collected from the meeting with DG revealed that the PMT upgrade project had a double role, one of which, was not revealed before the project's completion. In other words, beyond the initially stated objectives of the IT project before the project's start, it seemed that the PMT implementation project had additional objectives that were revealed only after its completion. For instance, at the beginning of the project, I was required to enquire about the organisational issue as well as on the best research-guided methodology to solve the issue, only within the scope and objectives of the very project, and within the technical specifications of the tool that were defined before the project's start. This observation could have explained why the PMT implementation has failed. More precisely, I could have assumed that the PMT project failed because the DG "justified" the negative behaviours of the detractor group members, and argued that the PMT was not useful for them. However, the DG claimed that he had always encouraged the employees to use the PMT and never showed indifference or avoidance behaviours in front of them. Hence, this led me to consider this observation as an insufficient reason for PMT implementation failure and consider phenomena from outside the project's social and technical perimeter as possibly negatively impacting the project, that is, a question remained without answer:

> *The junior consultants were enquired about the reasons why they rejected the PMT, yet they have criticised another system in the firm: the ERP (SX). Why was this?*

When I shared the anonymised statements of the junior consultants with the DG, he was surprised by the negative perception that the recently hired employees at EI had toward the internal IT tools. He argued that it is surprising to see how junior consultants were capable to point at ongoing conflicts and even get engaged in conflicts for some, although they got hired only recently, and so they should have had no choice but to abide by the rules, showing no conflict at all *"just like any new employee at a new firm!"*, according to the DG. The DG also argued that he does not understand why these consultants evoked issues toward the ERP while they were being enquired about the PMT, stating the following:

> *"I understand that SX in its actual state is a big problem for many! But I am surprised to see those employees generalising the SX difficulty and mixing it with the PMT! These two systems have nothing to do with each other!" (the Director-general of EI).*

According to the DG, the ERP has been deployed in 2009 but has not been "properly used" since, because of passive resistance behaviours and internal conflicts toward its ergonomics, uneasiness-to-use, heavy and unnecessary modules. He also added that the top management had been lately *"suffering from a serious lack of short-term financial visibility"* because the ERP has been generating inaccurate information based on the insufficient use of the system by both managers and consultants. Additionally, the DG stated the following:

> *"When I decided to deploy SX in 2009, everyone shouted that it's a very heavy system which isn't compatible with the needs and the small size of the firm. Back then, we were 30. Now we're more than 60 persons! It's now time for everyone to stop opposing SX and transfer all the energy into using it instead! (the Director-general of EI).*

And the following:

> *"…It's funny! SX is epidemic. It has been more than 5 years that I see people complaining about it. Even newcomers complain about it. And now, you come here and tell me there might be a problem with SX! Ha-Ha!*

When I asked the DG whether he thought the ongoing negative ERP experiences could have been impacting the PMT project, he argued the following:

> *"I am eager to learn how these two distinct problems could be related. I think you should investigate further on this matter and come back to me. I should solve this SX problem asap anyway! We cannot go on like this! (the Director-general of EI).*

Two months after the meeting with the director-general, the top management initiated an internal campaign to invite consultants to start using and filling the firm's ERP properly. More specifically, because the staff almost doubled during the year (during Cycle 1), the HR manager, the DG and other managers sent emails to all the staff to state the new challenges facing the firm following the massive recruitment of junior consultants, complaining about the lack of operational and financial visibility due to substantial lack of information being filled by employees in the ERP. The email senders argued that without operational visibility, managers would not be able to assess whether the firm was healthy, which jeopardised the employees' bonuses but also the survival of the company. The DG also added that to help recently-hired consultants but also experienced employees in learning new-skills related to EI's external activities but also internal procedures, and with a view to remove all obstacles for filling the ERP with pertinent information, he would launch an internal "Innovation Academy". Two weeks later, a new employee, Ms Lepoux joined the firm and was asked to lead the "Innovation Academy". Ms Lepoux was a psychologist, holding a doctorate in "Enterprise Psychology". She later sent further emails to invite all top managers and recently-hired consultants to several integration seminars. This "internal campaign" and events were considered as "new" and "surprising" to a few employees at EI, including myself. Indeed, I was not aware that the DG had a plan to tackle the ERP situation this fast, nor to hire a psychologist to do so. In other words, at first, during the last meeting with the DG, I only wanted to get a few clarifications on why in his opinion some consultants expressed conflicting statements toward the ERP while they were interrogated on their behaviour toward the PMT. Surprisingly, the DG argued that the firm was facing a major problem with the ERP. Then, he hired a psychologist and created an internal school to train the consultants on how to use the system. Moreover, he stated in his emails to the staff that the firm's survival depended on the proper use of the ERP.

At that moment, I considered that it would be necessary to end the first cycle of my AR and understand this new, unexpected event in an attempt to a "conflict contagion" phenomena

from outside the scope of my very research context that may appear to affect my research. The DG agreed with me on this and encouraged to proceed with my analysis through a second AR cycle. Indeed, the marked escalation of events made me consider that resolving conflicts towards the PMT was not possible at the moment, as I realised that the initial top management's objective to implement the PMT successfully was involuntarily diverted toward another IT system in the company. Therefore, it would not have been consistent at this stage to force a PMT consensus of a conflict-resolution strategy. Hence, the second cycle had the objective to tackle a couple of questions that remained without answer:

1. *Is there any chance that the conflicts toward IT might have been contagious?*
2. *Why did junior consultants criticise the ERP, while their initial conflicts were toward the PMT?*

The table below provides a summary of the main activities made collaboratively in Cycle 1 as well as the main findings and learnings obtained at the end of the cycle. These results are the key factors that induced the second action research cycle.

Action taking	The purpose of Cycle 1 was to upgrade the tool then deploy the new version on a large scale at EI. Accordingly: • A "Workshop" session was organised with key employees associated with the DST project; • Then, I conducted 9 semi-directive interviews with key employees initially invited to the brainstorming and Workshop sessions in an attempt to understand why the resistance behaviours continued to occur even after the tool's upgrade; • A "No Go decision" was collaboratively made with the firm's director-general concerning the implementation of a new version of DST.
Evaluating	• Conflicts were evaluated during the PMT "Delivery" meeting: 5 categories of conflicts unfolded from the semi-structured interviews; • Although some key employees participated in the upgrade process, they have rejected the PMT stating task-oriented issues; • These statements have gradually led other meeting participants to state other technical problems that blocked the imminent possibility of using the PMT, and therefore engaging in the same active resistance behaviours as their peers; • The PMT project had a double role, one of which, was not revealed before the project's completion. The director-general used the action research project to "legitimise" the PMT as "scientific-based" in the eyes of the firm's clients; • Beyond the PMT project, the data collected revealed an unexpected cause of resistance toward an entirely different IT system at Efficient

	Innovation Corporation, that is, the firm's Enterprise Resource Planning (ERP) system, called "SX".
Specifying learnings	• A task oriented conflict appeared to hide socio-political oriented conflict – the tool was used by the "partisans" groups to cover the lack of skills of junior consultants; • On the other hand, the "detractors" group badly perceived the PMT from an "ideological" point of view; • Indeed, the tool was a viewed as a possible cause for autonomy loss, putting in jeopardy their practices and ways of doing, should they be imposed by the top management; • Surprisingly, new independent issues associated with the firm's ERP system came to light; • It appeared that the ERP has been successfully deployed in 2009, but has not been properly used because of internal conflicts that have been accumulating over time; • It was not consistent at this stage to force a PMT consensus of a conflict-resolution strategy; • It was necessary to end the first cycle of my AR and launch a second AR cycle in an attempt to understand the situation of conflicts toward another IT project, from outside the scope of my very research context, that may have been affecting my AR project.

Table 35: A Synthesis of the findings of Cycle 1

3.2 Second Action Research Cycle

Cycle 2 (05/15 – 04/16, 11 months)
Objective: • Enquiring about previous and ongoing conflicts toward the existing ERP system; • Identifying negative impact relationships between the ERP project and PMT project, if they ever exist; • Enquiring about conflict contagion mechanisms between the two distinct IT tools; • Proposing a research-based solution for the new organisational issue.
Key sources: • Academic literature on contagion and intragroup conflict contagion; • Existing documentation for the purpose of the new "Innovation Academy"; • Conducting a total of 14 informal conversational interviews with both experienced and junior consultants at two different EI subsidiaries.
Data analysis: During several sessions with key employees at EI, direct observations, verbal and non-verbal communications were noted.

3.2.1 Design (Cycle 2)

The second cycle (May 2015 – April 2016) was a transitional phase, that is, it had the purpose of identifying past and ongoing conflicts toward the firm's ERP, and enquire about possible conflict contagion mechanisms between the two distinct IT projects at Efficient Innovation Corporation and between key employees in particular. Identifying such phenomena might reveal additional causes for PMT rejection. The second cycle followed more a problem-solving approach (Chiasson et al., 2009) as it was more explorative, and focused on insights that can be induced from organisational problem-solving activities. Indeed, I have used the data issued from my problem-solving activities to compare and contrast with existing IS theories (Chiasson et al., 2009), and develop new theoretical models and knowledge at the end of the cycle. As for **diagnosing**, point one: *Enquiring about previous and ongoing conflicts toward the existing ERP system*, and point three: *Enquiring about conflict contagion mechanisms between the two distinct IT tools*, were key activities through which I have deepened my understanding of the unexpected organisational issue concerning the ERP. Then, I reviewed the literature on intra-group conflicts (De Wit et al., 2012; De Dreu and Weingart, 2003) and intra-group contagion (Jehn et al., 2013; Li and Hambrick, 2005; Barsade, 2002; Cialdini and Trost, 1998; Wheeler's, 1966), and especially academic articles in which conflict contagion is discussed as for conflict behaviours that arise in several members of a group, likely leading

other observing members to adopt this negative behaviour (Jehn et al., 2013; Phillips and Loyd, 2006; Li and Hambrick, 2005; Morris and Keltner, 2000).

Since I started my investigation at Efficient Innovation Corporation in February 2014, the firm had been experiencing strong growth. The number of employees increased sharply (nearly doubled) in a concise period (around 1,5 years). Accordingly, EI decided to set up a parallel "digital" development strategy, through the "Innovation Academy", in order to be able to monitor this growth as close as possible, and train its consultants to use the internal ERP between other "digital" applications that aim to help both the top management and employees be more efficient, with the priority given to newcomers. Among the data sources I used, I examined an internal document that detailed the activities and objectives of the new "Innovation Academy". The remaining data were collected from a total of fourteen unstructured in-depth interviews (informal conversational interviews), and participant observations noting verbal and nonverbal behaviours of both junior and experienced consultants, to study culturally shared perceptions of everyday experiences (Van Manen, 1997). For instance, Mumford (2001) posits that using these methods of data collection provide valuable comparative data that can assist the researcher to confirm or challenge his/her research questions.

Accordingly, regarding **data analysis**, the use of several sources of data collection in Cycle 2 allowed me to apply "data triangulation". Since data were collected from multiple sources, data triangulation was beneficial in increasing the validity of the learnings (Denzin, 2006). For instance, Thurmond (2001) highlights the benefits of applying data triangulation in social research, including confidence in the received data, and provision of deeper and clear understanding of the phenomena. Figure 34 below illustrates the triangulation process used in Cycle 2. Thus, regarding **action planning**, I reviewed the literature on intra-group conflicts and contagion and especially academic articles in which conflict contagion was discussed in terms of conflict behaviours that arise between several individuals and groups. Nevertheless, my objective was to deliver to the top managers at EI a research-based conceptual model to illustrate conflict contagion mechanisms through which employees might "contaminate" each other's behaviours. Because I was aware of my subjectivity as a researcher, and because of the limited time frame of my AR project, the literature review also included performing an analysis to determine the most appropriate data collection techniques to study human behaviours in a social context.

Figure 34: Data triangulation Process During Cycle 2

My analysis determined the original process used for data validation in this cycle was that of triangulation. This was crucial to my new research orientation as it assisted me in the development of perspective. For instance, Manion and Cohen (1994) posit that *"triangulation is the use of two or more methods of data collection in the study of some aspect of human behaviour. It is a technique of research to which many subscribe in principle, but which only a minority uses in practice"* (p. 233). Moreover, with respect to Pandit (1996), different sources of data gave me different views or vantage points via triangulation to deeply enquire about a concept and develop its properties and enhances the construct validity of the research. According to Foster (1982, p. 55), one of the most appropriate paths through which data may be triangulated is by the use of "Validation Groups". Hence, another **action planning** consisted of organising two "validation group" sessions throughout the second cycle. The members of the group consisted of the firm's DG, HR manager, Mr Dupont, Ms Lopoux, and the consultant that was in charge of IT maintenance when the ERP was implemented in 2009. The purpose of this group was to analyse and discuss the research undertaken collaboratively, and to exchange on the findings within the context of the research environment. According to Forrest (1983), *"judgements of the researchers need to be subjected to the mutual rational control of critical discussion by others who represent a broad spectrum of professional interests who are familiar with the nature of the research and have an interest in the outcomes"* (p. 55). Whitehead (1989)

argues that such a group would improve the validity of the data interpretation achieved. The same author posits that the optimum size for a "validation group" should be thought about the nature of the research, the size of the firm from which the evidence is being collected and the structure of that firm. The author also suggests that the group composition should be as wide and as varied as possible to achieve the best impartiality.

Regarding **action taking**, my first contribution was to develop an "IT conflict contagion matrix" (see Table 36 p. 159) to help me enquire about the evolution of intra-team resistance behaviours toward different projects in the firm's IT portfolio. This matrix was the result of my observations of management consultants made on the field. For instance, I often noticed a sort of an infectious "germ" that came to infect recently-hired individuals in contact with their new environment. In order words, the "germ" consisted of conflict behaviours toward IT tools at EI spreading within the "population" of Efficient Innovation Corporation. As a consequence, new members of the firm (recently-hired consultants) became infected by the "germ" causing them to behave in the same manner as their peers. Moreover, these observations made me divert my focus from the particular IT project being investigated to the whole IT project portfolio of the firm. For instance, the data collected in Cycle 1 showed several references being made to conflicts toward the firm's ERP, while the purpose was to enquire about conflicts toward the PMT, despite that two IT tools were different and had different "project team members".

From a general point of view, this phenomenon reminded me of Bandwagon effect discussed in the field of sociology (Colman, 2003). According to this concept, the increasing popularity of a behaviour pushes more individuals to "get on the bandwagon", as well. In other words, when individuals observe the actions of others and make rational decisions based on the information they receive from them, because of informational cascades (when someone observes the actions of the people surrounding him/her and then – despite possible contradictions with his/her personal evaluation of the situation – engages in the same behaviouras), these individuals will ignore their personal judgment of the information and follow the behaviours of others (Bikhchandani et al., 1992). More specifically, and in accordance with my field, these behaviours were conflicts toward IT tools. To carry out this analysis, I used the theoretical model of Jehn et al.'s (2013) of conflict progression and evolution in a team over time, from involving just a few members to drawing in the entire team. Accordingly, I also developed a conceptual research model of intra-team conflict contagion over time in a portfolio of IT projects (see Figure 20, p. 82), using the same literature sources as Jehn et al. (2013), to be explored in my action research project.

To develop the "IT conflict contagion matrix", I draw from the literatures on intra-team conflict (Jehn et al., 2013; De Dreu and Weingart, 2003), group composition and coalition formation (Jehn et al., 2013; Li and Hambrick, 2005; Mannix, 1993; Lau and Murnighan, 1998), and emotional contagion (Jehn et al., 2013; Barsade, 2002; Hatfield et al., 1994). Because of the difficulty to observe and record "everything" in a certain setting (Merriam, 1988), I compared the findings of my literature analysis with those of unstructured interviews right after each interview by answering to a list of several questions as for the factors that might have triggered conflict contagion. Although informal, conversational interviews do not usually require a prior preparation of an interview grid, the matrix served as an "unofficial interview guide", which helped me to ask the "good" questions, as of why who and what should I look for during the interviews. As another **action taking**, one aspect of the inquiry that I performed during Cycle 2, was to validate my interpretations and therefore the "validation group" was of crucial and powerful part of the triangulation process.

According to Patton (1990), an informal, conversational interview is an unplanned interaction between a researcher and his respondents that occur naturally during participant observation. It is the most used open-ended form of interviewing techniques used by researchers (Patton, 1990). It consists of conducting discussions and interactions with individuals that are not necessarily aware that they are being interviewed. My questions were often generated spontaneously from events that occurred during my observations at a particular point in a particular setting and by what the individuals were saying to me. These unstructured interviews allowed me to maximise my understanding of what I was observing and what the individuals whom I was observing thought about what was happening. Hence, this interviewing is very flexible (Patton, 1990). According to the same author, answers evoked by the researcher's initial questions shape subsequent ones. In other words, the researcher is required to listen, think and talk almost at the same time to frame another question, either to detail further the earlier answer in more depth or to redirect the interviewee's attention to an issue more relevant to his/her inquiry. That said, the researcher should have general questions in mind based on what s/he is observing (Patton, 1990).

In my case, my ultimate goal was to collect sufficient data to answer the questions formulated at the end of the first cycle. Because of the unanticipated and informal nature of the conversational interviews, I was not able to audio-record the discussions. Consequently, I was not able to do the same qualitative analysis like the one of Cycle 1. However, I used the observation method of Yin (1994), who argued that observation is an additional source of data

essential to get an in-depth understanding of the social context of the firm. I used a checklist of elements, as of the factors that might trigger conflict contagion, which were likely to be present in my observations during the interviews (see Table 36). These factors are not exclusive and may overlap. Bearing all these critical factors in mind, regarding **action taking**, I took advantage of being a member of the team of junior consultants to note verbal and nonverbal behaviours of employees from all categories toward both the ERP and the PMT. Moreover, through observation, I was able to extend beyond naturalistic observation because I was a "player" in action, taking on the role being studied, as a junior consultant myself.

Factor (Fi)	**Description**	**Authors**
F1. Coalition formation	Coalition formation occurs when two or more "conflicting" individuals jointly act to affect the outcomes of others. Group members who are close (personally) to other members involved in the initial conflict may feel compelled to support the team member they are closest to, thereby forming coalitions along conflict lines.	Jehn et al., 2013; Phillips and Loyd, 2006; Jehn, 1997; Crano and Cooper, 1973; Kelley and Thibaut, 1959
F2. Emotional and behavioural contagion	A sharing of attentional, emotional, and behavioural feelings, whether positive ones (e.g., happiness) or negative ones (e.g., anger) that have the same adaptive utility (and drawbacks) for social entities (dyads or groups) as has emotion for any individual.	Jehn et al., 2013; Barsade, 2002; Kelly and Barsade, 2001; Barsade and Gibson, 1998; Hatfield et al., 1994
F3. Threats to individual and team outcomes	When some team members become involved in a conflict, other members may become involved when the behaviours of the conflicting members inhibit the outcomes of the team or other team members out of concern for the team and the organisation.	Jehn etl a., 2013; Langfred, 2000; Hackman, 1987; Van de Ven et al., 1976
F4. Behavioural lock-in	A situation of behavioural irreversibility due to learning and habitation. It occurs when the behaviour of an individual is "stuck" on a non-optimal path because organisational culture is preventing the change.	Davis, 2015; Barnes et al., 2004

Table 36: Non-Exclusive Factors that Might Trigger Conflict Contagion

As for the method of selection of the participants that were observed and interviewed, assuming that junior consultants were "contaminated" by experienced consultants, I had to select both junior and experienced consultants. All the consultants at EI were intended users of the ERP. Nevertheless, because my unanswered question was: *"Why did junior consultants criticise the ERP, while their initial conflicts were toward the PMT?"*, I had to select junior consultants that were also intended users of the PMT to enquire about a possible IT conflict contagion between the ERP and the PMT. Accordingly, I selected the same four junior consultants (see Table 31, p. 130) with whom I conducted interviews during Cycle 1.

Conducting observations and informal interviews with these four consultants was an opportunity to perform an in-depth inquiry about a possible contagion phenomenon between them and their experienced colleagues (n=3) with whom they shared their office in the Parisian subsidiary. On the other hand, the experienced consultants were considered as "ERP detractors" because they have repeatedly been expressing negative behaviours toward the ERP according to the data collected from the interviews with the four junior consultants in Cycle 1. Accordingly, I have also selected the three experienced consultants as subjects with whom I conducted unstructured in-depth interviews and performed observations. Then, I conducted the same type of interviews and observations with four junior consultants and two experienced consultants at another subsidiary of EI, in Montpellier. These new six interviewees were selected based on an informal discussion with the HR manager that argued that the same conflict contagion might be happening in Montpellier because the two experienced consultants there were also known as *"indirect contributors of the bad image of the ERP"* according to the HR manager. The experienced consultants (n=5) in Paris and Montpellier were interviewed to confirm their involvement in conflicts toward the ERP and the conflict contagion process.

Then, I conducted an informal interview with another experienced consultant in Montpellier that was in charge of IT maintenance on a part-time basis since the deployment of the ERP, to discuss the findings of the "Innovation Academy" report. I had no idea about preconceived hypotheses that could have been formulated to assume the causes of the conflicts toward the ERP and the causes or mechanisms underlying conflict contagion with which EI was confronted. Hence, my intention was to gain an in-depth understanding of the reality of the conflict behaviours toward both IT tools and supply my research-based conceptual model on the conflict contagion process.

I carefully used probes to get more in-depth answers or to follow up on points of interest. For instance, silence was sometimes deemed as the best probe. Being silent once interviewees paused had encouraged them to continue. Also, I avoided interrupting a good story and instead make a note to probe a particular point later in the interview. The intensive and detailed data required goals lead me to choose participant observation and unstructured interviewing as data collection methods. Table 37 below recapitulates the interviewees selected during Cycle 2.

Subsidiary	Group of consultants	Number of interviews
Paris	Experienced	3
	Junior	4
Montpellier	Experienced	2
	Junior	4
Montpellier	Experienced (IT maintenance on part time)	1
Total unstructured in-depth interviews		14

Table 37: Informal Conversational Interviews in Cycle 2

When each category of the identified conflicts was conceptually dense (Strauss and Corbin, 1998), variations in the category have been explained, and no further data in line with the categories emerged during data collection, causing data saturation. In other words, when all my respondents from the two groups of consultants were expressing the same ideas over and over, and nothing new was emerging from my observations in the field, I assumed that no further data collection was deemed necessary. Table 38[18] below shows the group of consultants and the "anonymised codes" of the interviewed employees.

Participant (Pi) code	Group of consultants	Subsidiary
P1	Experienced consultant	Paris
P2	Experienced consultant	
P3	Experienced consultant	
P4	Junior consultant	
P5	Junior consultant	
P6	Junior consultant	
P7	Junior consultant	
P8	Experienced consultant	Montpellier
P9	Experienced consultant	
P10	Junior consultant	
P11	Junior consultant	
P12	Junior consultant	
P13	Junior consultant	
P14	Experienced consultant (in charge of IT maintenance)	

Table 38: Codes and Groups of the Interviewees in Cycle 2

[18] participant names and pseudonyms were anonymized based on the request of both the top management and the interviewees.

As a result, the second cycle ended with the delivery of a filled "IT conflict contagion factors matrix" clarifying the conflict contagion phenomenon identified throughout the cycle.

3.2.2 Results (Cycle 2)

First, as for **specifying learnings**, both task-oriented conflicts and socio-political oriented conflicts toward the ERP unfolded from the analysis of the data collected from the internal documentation on the "Innovation Academy" and the ERP. My **findings** were the following: junior consultants joined the first conflict of their experienced peers because they were socially and professionally "attracted" to them. Moreover, experienced consultants exchanged active discussions on the conflict issue with their "private support networks" leading to extending the conflict situation to other experienced consultants that were not previously engaged in the initial conflict. Private support networks consisted of several experienced consultants at each subsidiary of EI, that had friendly ties with each other. Then, my **findings** were that the interviewed junior consultants (n=8) opposed to the PMT because they were "contaminated" by experienced consultants that had been repeatedly and explicitly expressing conflict behaviours toward another IT system at EI, the ERP system. More specifically, through emotional and behavioural contagion mechanisms (Jehn et al., 2013), the conflict involvement of junior consultants was not only toward the initial subject of conflict (the ERP) but to the very "state" of being in conflict (resisting to technology in general). In other words, IT conflict contagion had succeeded to compel employees to support their peers in their conflict toward the ERP and thereby to join them along conflict lines and to express conflict behaviours toward both the ERP and the PMT. Nevertheless, by resisting toward the PMT, the junior consultants had an additional opportunity to comply with their physically-close colleagues through emotional and behavioural contagion (Greer and Jehn, 2007a; Yang and Mossholder, 2004; Lee and Allen, 2002; Barsade, 2002; Bodtker and Jameson, 2001; Kelly and Barsade, 2001; Barsade and Gibson, 1998; Hatfield et al., 1994). Finally, my **findings** revealed an "IT Resistance Behavioural Lock-in" phenomenon. More specifically, this phenomenon occurred when the resistance behaviours of an individual toward IT are "stuck" due to his/her prior exposure to resistance behaviours that occurred in the past toward an IT system, which presently and continuously make the individual resist toward any new IT. Moreover, "IT Resistance Behavioural Lock-ins" were highly "contagious", as individuals captured the conflict behaviour of others through emotional and behavioural contagion and coalition formation. At the organisational scale, the same phenomenon occurred, which is called "IT Resistance Path Dependency", a process in which EI faced the same state of "illness"

from resistance behaviours toward IT in general all along its path due to prior conflicts toward the firm's ERP. These results are cited hereafter by the relevant data source.

- **Document Analysis**

In Cycle 2, performing document analysis is especially applicable to my qualitative action research. I performed an analysis of an internal document that detailed the objectives and reasons for which the "Innovation Academy" was created. A major part of the report consisted of an internal survey on the situation of the use of the ERP system by the employees of EI. The purpose was to shed light on the main weak points of the ERP system as expressed by the consultants. The survey was realised by a research intern in human resources, under the supervision of Ms Lepoux, without any interference or intervention from my part. The report was officially published internally in 2016, during Cycle 2. Document analysis served to identify both task-oriented and socio-political oriented conflicts toward the ERP system. The data collected from the report provided me with "an external eye" on the context within which I operated as a researcher. In other words, it allowed me to analyse what other researchers thought about the same organisational problem studied, that is, conflicts toward SX. Document analysis was deemed as less time-consuming and more efficient than other research methods, that is, it required data selection, instead of data collection.

The data collected from the survey revealed that, since the foundation of Efficient Innovation Corporation, the transfer of know-how between experienced and junior consultants was carried out informally. In other words, experienced consultants transferred their knowledge on the firm's internal procedures while simultaneously carrying out their daily routine assignments without doing any formal training. Furthermore, no official training sessions were made on the company's ERP system called SX by HR staff. Consequently, recently-hired consultants were supposed to learn by themselves the administrative procedures and take the initiative to ask questions to their experienced colleagues when needed or read internal word documents which were lengthy and old, according to the authors of the document. Thus, the internal "academy" of innovation at EI responded to the needs of both the top management and junior consultants to ensure the transmission of internal know-how, operational practices and the harmonisation of these practices within the organisation.

SX is an enterprise resource planning system intended for small and medium-sized companies that are specialised in services and consulting (see Figure 35). Its main function is to coordinate all the activities of the organisation around one information system. Thus, SX collects and provides reports of the working hours and the expenses engaged by the consultants.

SX is at the heart of the consulting activities at Efficient Innovation Corporation because all the assignments are managed using the system: the creation of the assignment, monitoring, invoicing and ending the assignment. Similarly, the SX system is the only mean through which the top management could track and measure the day-to-day financial "status" of the company, make short term decisions, and set operational targets.

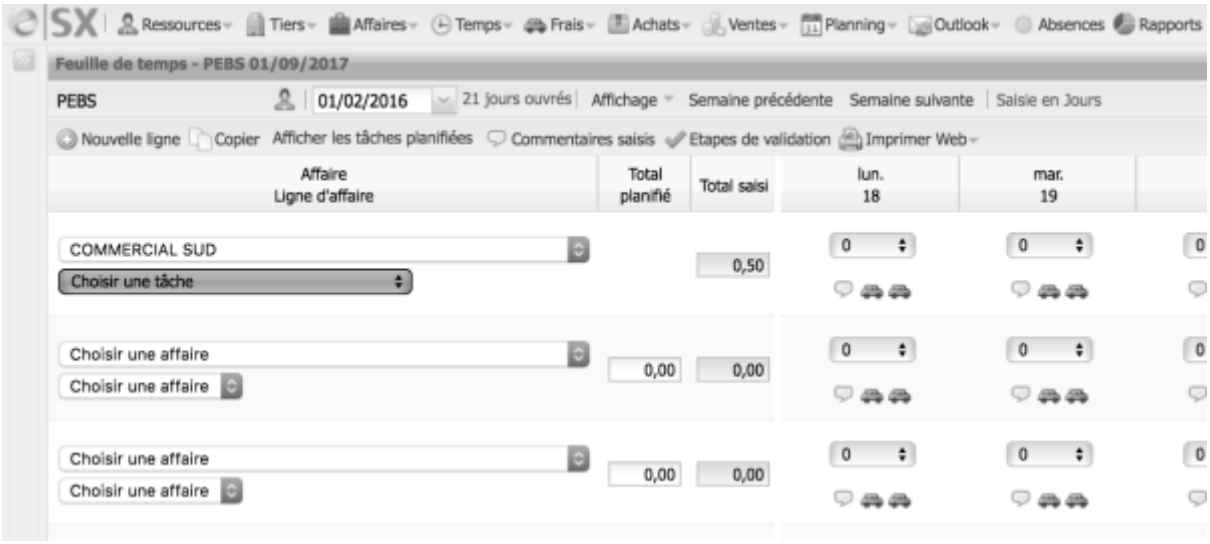


Figure 35: A Screenshot of the ERP SX at Efficient Innovation Corporation

The purpose of the survey conducted by the psychologist and her intern was to identify precise and urgent training needs on the firm's ERP system. Accordingly, the psychologist and her intern developed a questionnaire and distributed it to a total of 60 consultants using Google Forms. 49 responses out of 60 were obtained, representing an 82% participation rate. The authors posited that EI's administrative and financial department complained that a large number of consultants did not grasp the utility of filling the ERP system in time, with complete and accurate information. Therefore, top managers had to face misleading reports because they were based on erroneous or incomplete data. As a consequence, several managers at the firm had to send regular email and phone calls to remind consultants to comply with the deadlines and encourage them to take the time needed to provide accurate data inputs on their assignments.

On the other hand, senior, experienced and junior consultants also complained about the difficulties they have been facing with SX because of several technical issues, such as complex ergonomic interface, design, non-fit with users' needs, complicated-to-use system. Also, the survey showed that some consultants did not adhere to the reporting procedure because they felt controlled and evaluated, causing a feeling of autonomy loss. The survey also reflected the consultants' incomprehension of the overall utility of SX, that is, the "lack of

meaning" led consultants to consider reporting in SX as an obligation imposed by the hierarchy and a constraining administrative process to be respected. Hence, because of the survey, I was able to identify two categories of conflicts toward the ERP, task-oriented conflicts on one side and socio-political oriented conflicts on the other. From the viewpoint of the consultants, the survey reflected a generally negative perception toward the ERP, as 87% of the respondents stated that the ERP was tough to use because of ergonomics problems. The questionnaire included qualitative questions, as blank fields under Google Forms that permitted consultants to comment their quantitative responses. For instance, a senior consultant expressed a task-oriented conflict, related to the new tasks that he was required to fulfil, stating the following:

> *"There's a big issue of lack of time! There's no time planned to properly learn how to use of SX. Besides, the time spent on SX is not really counted financially by the top management and constitutes an extra workload for us in an already busy schedule!" (A senior consultant at EI).*

Regardless of their work experience, or statuses, the consultants expressed both task-oriented conflicts toward SX (e.g., poor and complicated user interface, useless functionalities) and socio-political oriented conflicts (e.g., constraining administrative procedures generating a sense of being under surveillance). For instance, a junior consultant expressed another task-oriented conflict related to the system's ergonomics stating the following:

> *"The main problem of SX is its ergonomics which does not make it an intuitive platform!" (A junior consultant at EI).*

An experienced consultant also stated a task-oriented conflict related to the new tasks that he was required to fulfil stating the following:

> *"There is a lot of data today that needs to be provided (time spent on each assignment => 40 assignments during CIR period) load planning, updating billing plans, rate of progress, which is for me very difficult task to do, or maybe I did not understand how to do it. It is necessary to fill all data / CIR assignments/montage / gestion .... and no time is planned for the consultants to do it ..." (An experienced consultant at EI)*

As for socio-political oriented conflicts, 33% of the respondents argued that SX is used by the top management to monitor them and measure their efficiency in their assignments. In the qualitative part of the questionnaire, I noted the following statements that reflected conflicts due to loss of power:

> *"It's not acceptable that our managers keep on constantly monitoring and assessing our work basing on a unhuman digital indicator on SX!" (An experienced consultant at EI)*

> *"The firm can be able to keep an eye on its financial capacity without necessary keeping her eyes on the work of its consultants…! (A junior consultant at EI)*

> *"Even if SX was easy to use, I would still think that it would face use problems because the original cause for nonuse, which is hierarchical monitoring, remains the same!" (A junior consultant at EI)*

As previously said in this section, no formal training sessions have been proposed to the employees at the firm since the deployment of SX. However, EI's workforce had doubled since then. That said, in 2011, one experienced consultant who was in charge of IT maintenance on a part-time basis, produced an eight-page document, listing the most important ERP-related tasks that the employees should perform. This document was available on the internal data-sharing platform called "Wiki". However, only a few employees knew it existed. Moreover, those who knew of the document's existence argued that the material was complicated to understand and that they did not have time to read it. For all these reasons, the DG decided to hire a "specialised" psychologist and an intern in human resources to design formal and efficient training sessions dedicated to SX, in an attempt to remedy the negative perceptions toward the system and engage newcomers in the learning process right from the start of their employment. According to the Chief Financial Officer (CFO), who commented the results of the survey during an informal discussion, the data filling rate in SX was irregular, incomplete, which has been obliging him to carry out internal intensive email campaigns to incite the staff to recheck the data they have filled. Also, the CFO stated in the report that lack of rigour in data entry resulted in false statistical indicators which seriously jeopardised the survival and future growth of the firm. Because the production of these indicators is based exclusively on

SX, it was of paramount importance that consultants comply with reporting procedures to produce reliable indicators for the top management, according to the comments of the CFO. The chief financial officer ended his remarks with a complaint that his accounting department was suffering from direct financial losses or billing delays because of poor data entry. Moreover, this internal organisational problem sometimes led to the deterioration of the company's image among its customers. According to the CFO, it has been seven years that SX was deployed at the firm, and it represented a heavy investment. Hence, migrating to another ERP solution was not a feasible option for him. Therefore, the CFO argued that the "Innovation Academy" is an excellent opportunity to provide the consultants with specialised training sessions to "clear the obstacles out of their way" and invite them to use the system accurately.

As another specifying learning, the statements of the CFO made me realise a new and urgent organisational problem associated with information technology. This problem was not identified nor discussed with me before the start of my research. In other words, when I started my investigation at EI, I was not aware that an entirely different IT system was also witnessing resistance behaviours causing serious organisational problems. Consequently, not only that I failed to implement the new version of the PMT, but I also witnessed my research subject "disappear" and being replaced by another issue. This observation encouraged me to consider that the identification of task-oriented and socio-political oriented resistance behaviours toward an IT project is necessary, yet insufficient, to diagnose and solve the organisational problem. More specifically, instead of focusing on conflicts toward one IT project, one should take into account similar negative behaviours toward other IT projects at the firm as they might affect the ongoing research subject without the knowledge of the researcher. Rather than focusing on "IT project" resistance, one should investigate "IT portfolio" resistance and get the whole picture of conflict behaviours toward several IT projects at the studied firm.

Nevertheless, my prime objective was to identify conflict contagion mechanisms between two IT tools at Efficient Innovation Corporation. Therefore, the survey served as a starting point, through which, I was able to identify the "general picture" and main conflict themes, whether task-oriented or socio-political oriented resistance. Then, through daily participant observations and informal conversational interviews, I aimed to enquire about the contagion process through which these categories "exchanged" resistance behaviours. Before I tackle the findings of my field observations and unstructured interviews, it would be essential to highlight the information that I selected and analyzed throughout the survey which were relevant to my first and second research question (see Section 1.8.1, p. 83).

According to the authors of the report:

- 87% of the respondents have engaged passive resistance toward SX because of its *"very poor and complex ergonomics"* (Task-oriented conflict);
- 63% of the respondents have been involved in passive resistance toward SX because no training sessions were held on the subject and no *"easy-to-understand and updated guidelines"* were available (Task-oriented conflict). 89% of these respondents were newcomers (less than two months at EI);
- 83% of the respondents have been engaged in passive resistance toward SX because of *"constraining administrative processes"* induced by the system (Socio-political conflict);
- 33% of the respondents have been involved in passive resistance toward SX because of *"constant monitoring by the hierarchy"* of the consultants' performance (Socio-political conflict).

Consequently, through the document analysis, I was able to answer the second question that remained unanswered in Cycle 1: *"What were the main task-oriented and socio-political oriented conflicts toward the ERP?"*. That said, in order to answer my first question evoked at the end of the first Cycle, as of *"Why did junior consultants criticize the ERP, while their initial conflicts were toward the PMT?*, I had to collect more data from other sources such as informal conversational interviews and field observations in order to assess human behaviour and contagion. Moreover, human behaviour and conflict contagion are dynamic processes (Jehn et al., 2013) that evolve with time, through emotional contagion and group composition and coalition formation mechanisms. The data collected through the analysis of the report reflected static conflict states. Instead, I needed to collect and observe "living" data to provide assumptions and answer my research questions. Through unstructured interviews and participant observations, I was able to observe how interpersonal, or dyadic, conflicts may unfold in a team setting and show how by understanding the occurrence and spread of these conflicts at EI, I gained a more multifaceted knowledge of contagious conflicts between the employees at the firm. Then, through data triangulation, I was able to compare my findings from the internal documentation analysis with those from the observations and in-depth unstructured interviews.

- **Observations and In-Depth Unstructured Interviews**

During Cycle 2, a major part of the data collected on the behaviours of the employees at EI were collected through a 10-month participant observation and a total of fourteen informal

conversational interviews with both experienced and junior consultants to enquire about a possible IT conflict contagion phenomenon. Because unstructured interviews were spread over the duration of the second cycle, for this type of longitudinal study, I was able to capture rich, in-depth data very essential to the understanding of behavioural evolution. A one-off survey, for example, would have merely provided a point-in-time snapshot (Dey, 2003). Because I was also an employee of the studied firm, I was able to "live" what other lived and observe the evolution of conflict. Efficient Innovation Corporation is a complex environment with multiple and sometimes conflicting goals, with important external drivers influencing conflict priorities and evolution. Hence, I would not have been able to understand the firm's complex environment if I were not "one of the team" as a member of staff within the company. The discussions in this cycle were overt and unstructured. However, Pretzlik (1994) argues that structure can inhibit creativity and flexibility in observational research, as it is practically difficult to categorise phenomena during the events. Consequently, informal interviews during this cycle were heavily utilized, as I was able to observe events and categorise them later, that is, no interruption during the interviewing period was required. That said, I have shared my learnings in "Validation Group" at each step of data analysis to refine this analysis and de/validate my interpretations.

Last but not least, I have categorised my observations with respect to the academic literature on information systems and psychology. More specifically, I have reviewed the literature on intra-team conflicts, conflict contagion mechanisms, group and coalition formation, as well as on the influence of prior IT projects on ongoing IT initiatives. Respectively, at the end of the Cycle 2, I have shared the filled "IT conflict contagion matrix" with the DG (see Table 39). I assumed that the more I had "Yes" answers to the questions raised in the matrix, the more the firm would be likely witnessing high-energy conflict contagion (Jehn et al., 2013; Barsade, 2002), lock-in mechanisms (Kucukyazici, 2014), and conflict self-reinforcing mechanisms (Mahoney, 2000) leading to "IT Resistance Path Dependency", which is the process of getting locked in the reproduction of the conflict institutional pattern on the long term. Consequently, I present hereafter my findings.

Conflict contagion factor	Observation
F1 Did members support the team member they are closest to?	Yes. Junior consultants and their "conflicting" colleagues shared similar cultural and professional values, and therefore supported the "cause" of their experienced colleagues. Similarly, when two or more experienced individuals were friends, conflict engagement was easier.
F2.1 Were negative emotions spread to other group members?	Yes. When two or more "conflicting" individuals expressed their anger toward the ERP, other physically-close group members also got angry and stated the same arguments as their peers. However, junior consultants expressed anger toward another IT tool, the PMT.
F2.2 If yes, did these emotions heighten the behavioural involvement of the "contaminated" individuals in the conflict?	
F3 Did individuals with "positive" attitudes get involved in conflicts when the behaviours of the conflicting members inhibited the outcomes of the group?	Yes.
F4.1 Did the firm witness prior conflict experience(s) toward an IT system at some point in its history?	Yes. An ERP was deployed in 2009 but had not been adequately used (indifference behaviours causing data accuracy issues) since then because of internal conflicts between ERP-partisans and ERP-detractors that occurred during the last six years.
F4.2 Is the firm currently witnessing conflicts toward several IT systems at once?	Yes. The ERP was witnessing passive resistance behaviours (such as making jokes on the ERP, poor data filling, and voluntary delays in filling the ERP) from both experienced and junior consultants. Experienced consultants were also passively resisting to any new IT project at EI. If the top management used a forcing strategy with them, passive resistance behaviours shifted to active resistance and later to aggressive resistance. Similarly, and simultaneously, junior consultants were also engaged in passive resistance behaviours toward the PMT due to conflict contagion mechanisms occurring between them and their experienced colleagues.

Table 39: The Filled IT Conflict Contagion Matrix

My observations revealed that EI has a culture that encourages autonomy and individual initiatives by empowering employees in an attempt to incite them to innovate and keep them from leaving the firm. This has been contributing to the formation of several "identity groups". Paradoxically, because of this "liberal" culture, managers were no longer able to easily implement any new "rule" or internal procedure in their respective teams. For example, when the top management initiated the internal campaign to incite employees to fill the ERP with full and accurate data on a monthly basis and this before the fifth of every month, several consultants expressed negative emotions. Another example of negative emotions' occurrence, is when the top management decided to replace the free version of "Dropbox" that was used by all the consultants, by another data sharing platform, "NetExplorer", for data security reasons. Many consultants resisted the change and decided to keep on using "Dropbox". Accordingly, because of the autonomy and empowerment they have gained from the top management, the management consultants had the freedom to refute new methods proposed by

their middle-managers and therefore becoming engaged in conflicts toward them or with any other colleague that is "different" from them. For example, in the case of the PMT project, experienced consultants decided not to use the decision support tool, even after having given time to upgrade it and enhance its technical features. Accordingly, my observations revealed that resistance behaviours toward the PMT evolved between the group of "detractors" (experienced consultants that rejected the PMT), to become active resistance behaviours (during the upgrade of the PMT), then to become aggressive resistance behaviours as they felt they were being forced to use the PMT. On the other hand, by the end of each month, I observed experienced consultants getting tensed each time they received the electronic reminder from the HR manager to fill up SX. They explicitly complained that they did not have the time to do so. Moreover, it was interesting to see them complain to themselves without actually directing their complaints toward their junior colleagues with whom they shared the office. I detail hereafter the findings associated with each of conflict contagion factor identified.

- **F1. Coalition Formation**

Coalition formation was observed in Cycle 2 on two levels: (1) between junior consultants and experienced consultants on one side, and (2) in-between experienced consultants on the other side. The data collected throughout the observations and the interviews made with junior consultants in both Paris and Montpellier subsidiaries revealed that these individuals were socially close to the experienced consultants that resisted to the ERP as they shared the same professional aspirations. Hence, the junior consultants argued that they supported their experienced peers in their resistance toward the ERP. Moreover, the junior consultants argued that they idolised the professional skills of their experienced colleagues, and therefore by being their "followers", they trusted they would soon become highly-skilled like them. Accordingly, when I asked P4 about his relationship with his experienced colleagues with whom he shared his office, he argued that he was a "fan" of one of his experienced colleagues, stating the following:

> *"I actually learn anything and everything from P1. This guy is really a brain. I've done too many assignments with him and I can assure you he is a brilliant star! Let's say I'm a real fan of his." (P4)*

Then, after noting this statement, I asked him if he knew anything about P1's issues regarding filling SX every month, P4 argued that the top management was imposing useless internal constraints stating the following:

> *"Hah! Of course, he doesn't have the time to fill SX! I don't understand why EI insists that a guy like P1 to fill the ERP. I mean he is a very good consultant with a very high turnover. It's useless! They should leave him alone!" (P4)*

P4's statement made me want to enquire about whether he heard P1 complaining about SX. Hence, P4 stated the following:

> *"He never complained to me, but yes I often hear him complaining from lack of time and that he should spend 3 hours at home to fill the ERP because he already skipped the deadline fixed by the HR manager." (P4)*

and the following:

> *"It doesn't shock me though. Even if I'm not as busy as P1, I prefer to give the priority to my assignments instead of wasting time on internal procedures! It's really annoying!" (P4)*

Similarly, when I asked P5 how she would define her professional relationship with her experienced colleagues, she stated the following:

> *"I'm often required to work with all of them on different types of assignments. They have coached me on how to be at ease with clients and on the art of never saying sorry to the client if I am late to a meeting. Ha-Ha! These guys are the best!" (P5)*

Then, when I asked P5 if her experienced colleagues ever coached her on how to use SX when she joined the firm, she argued that they only showed her how to fill the system with time sheets, operational expenses and nothing more. Respectively, P5 stated the following:

> *"SX must have like a thousand functionalities! My colleagues only showed me how to complete my time sheets and how to enter my engaged expenses for reimbursement, and nothing more. To be honest with you, now that it's been a year I work here, I still don't know how to do anything else with SX!" (P5)*

and later the following:

> *"But I think the other functionalities are useless. This must be reason why they haven't taken the time to teach me further manipulations, and I think they're right!" (P5)*

Similar observations were made in the subsidiary of Montpellier. When I asked junior consultants there if their experienced colleagues coached them on how to use SX, two junior consultants stated the following during informal conversational interviews:

> *"Yes. P9 was very helpful to me, he took the time to teach me the very basic tasks on SX, but he also told me that the system should be drastically improved or replaced. Now that I have to use SX more in-depth, I totally agree with P9 on this!" (P10)*

> *"They didn't coach me on how to use SX because they needed help themselves! I discovered it by myself, like I did with everything at Efficient!" (P13)*

During an informal discussion with P6 on the subject of the ERP system at EI, he argued that he was surprised to see the significant burden that the employees had toward SX. He posited that when he was an intern at another firm, the internal ERP there was an integral part of the daily activities of employees. P6 expressed the following:

> *"Back at company X, we didn't actually have to ask ourselves whether the ERP was good or not. Additionally, it was so integral to everyone's daily routine as no one could have done anything without it." (P6)*

He added the following:

> *"At Efficient, I feel like it's in the culture to have the choice to decide on everything. SX is not mandatory, or even if it is mandatory, my colleagues here use it in a way it suits them the best and not in a way that suits the direction" (P6)*

Later in the discussion, P6 argued that EI has been indirectly tolerant toward some "good-working" consultants that were "indifferent" vis-à-vis the internal procedures. Thus, this had encouraged P6 to improve himself as soon as possible and become like his colleagues to benefit from the same tolerance and advantages as them. On the other hand, P7 stated that SX was not an issue to him. When I asked him his opinion on whether he received training from his near-by colleagues, he stated the following:

> *"I tried to ask P2 several times for help, but he told me that he didn't know too much things about SX. Besides he's often busy, which isn't my case. I learned how to fill the ERP and create new assignments sheets by myself. It's not so hard actually." (P7)*

Then, I asked him if he was aware of the burden at EI on issues surrounding the ERP, he posited that the first day he arrived at the firm, P2 told him that SX is the hazing of every newcomer and everyone must pass through the SX experiment. Later, through informal discussions, P7 stated the following:

> *"Now it's been 6 months I work here, I think that SX is a permanent hazing for everyone. Ha-Ha! I know it because P3 always say so." (P7)*

Later, during informal discussions, the same junior consultant stated the following:

> *"I don't actually think that my senior colleagues fill-up the ERP like they should. They don't have the time to do so. Also, I think it my colleagues are right. The system needs serious improvements". (P7)*

Accordingly, the data collected from these unstructured interviews revealed that employees from the same team align their behaviours to comply with socially similar individuals at the same time. This observation is consistent with Jehn et al.'s (2013) and Crano and Cooper's (1973) assumption that team members jointly act to form ideological coalitions. Consequently, following coalition formation, conflict situations are extended to include other members of the team. Nevertheless, in contrast with Smith's (1989) finding that members involved in the initial conflict proactively recruit other members to form coalitions, my observations reveal an alternative finding. Experienced consultants were observed expressing negative emotions each time they have received a reminder from the HR manager to fill up the ERP, but their resistance behaviour was passive, that is, they did not intentionally act to affect the behaviours of their junior peers. Instead, because of coalition formation mechanisms, junior consultants joined the first conflict of their experienced peers because they were socially and professionally "attracted" to them. That said, my observations confirm Jehn et al.'s (2013) assumption that the spread of conflict in teams is likely to be facilitated by coalition formation when conflicts occur. Through informal conversational interviews with each of the three experienced consultants that aimed to confirm their involvement in conflicts toward the ERP, I noted the following statements:

> *"Oh it's obvious – junior consultants on my team are like sponges. Ha-Ha! They are indeed contaminated by me. They know I'm not a SX fan. So they tend to do like me, their boss. They resist to SX because I resist to the SX! That's a fact!" (P2)*

This observation is consistent with the concept of behavioural mimicry between individuals (Chartrand and Lakin, 2013), a form of interpersonal coordination between individuals that are mimicking or being mimicked by other persons that are perceived as "legitimate sources" or "safe". P2, "proudly" expressed this statement after I asked him whether, in his opinion, he thought that he could have been indirectly "contaminating" the junior consultants under his supervision which could have been contributing to a generally negative perception toward SX. Similarly, P3 stated the following:

> *"I do not think I am the cause behind the negative perception toward SX. SX has a negative perception because it is negative by itself. But it's so normal*

to see junior consultants learning from us bad things. Learning isn't limited to the apprenticeship of good things only." (P3)

Then, P1 argued that he never said anything about SX to his junior colleagues because the subject was *"a total waste of time and energy".* He also added that the junior consultants would have sooner or later seen by themselves that SX was a "disaster". Indeed, P1's statements confirmed his engagement in conflicts toward the ERP.

On the other hand, my observations and interviews with the five experienced consultants in Paris and Montpellier revealed that when interpersonal conflict occurred between the HR manager and these consultants, due to their passive resistance behaviours toward the ERP, the members exchanged active discussions on the issue with their "private support networks" (Kolb and Bartunek, 1992) also leading to extending the conflict situation. Private support networks consisted of several experienced consultants at each subsidiary of EI, that had friendly ties with each other. For example, P2 argued that sometimes he felt it was necessary to him to feel supported by his colleagues in the same office with which he had friendship ties. Accordingly, P2 stated the following:

"Now it's been a while I work at Efficient and now that it's been also a while that SX exists with no improvement at all, I sometimes need reassurance from my friends here that I'm not the only one that thinks that SX has a problem!". (P2)

Then, I took the opportunity to ask him whether he thought by doing this he would indirectly contribute to engaging "positive" experienced colleagues of his in conflicts toward SX. His answer was the following:

"It takes one second to agree with my colleagues that SX has a problem. So no, I'm not the one who's wrong. The direction should provide solutions to facilitate the use of SX and my friends know this". (P2)

Similarly, other "members" of the private support networks, did indeed feel compelled to get involved in the initial conflict to support their friends, after hearing about the issue. During informal group discussions with two other experienced consultants in the Parisian office, the individuals stated the following:

> *"I am perfectly aware of the ergonomic issues that SX has. I use the system every day! That said, when I discuss with P2 on the SX subject, I see that sometimes the top management of EI tries to impose to use SX despite its imperfections. I totally agree with P2 that it's not possible to continue like this." (an experienced consultant in Paris – a friend of P2)*

> *"I spend in average 1 hour a day in filling SX with information of planning and assignment management. Even if it's been a long way for me to become familiar with the SX, I agree with P3 that the DG shouldn't be indifferent on this, and do something to improve the situation, maybe training sessions or I don't know what!" (an experienced consultant in Paris – a friend of P3).*

Similar observations were made at the subsidiary of Montpellier. Accordingly, an experienced consultant in Montpellier stated the following:

> *"Our voices must be heard up to the direction of Efficient. I think it is fair to support P9 and other colleagues here in their cause to enhance SX!" (an experienced consultant in Montpellier – a friend of P9).*

To answer my first question left at the end of Cycle 1, *"Is there any chance that the conflicts toward IT might have been contagious?"*, the data collected from the informal group discussions revealed that coalitions might form as initially, uninvolved team members feel the need to also negatively judge and oppose the opponent of the members they are close to, thereby leading to the involvement of the initially uninvolved members in the IT conflict. This observation is in line with Jehn et al.'s (2013) assumption that coalition formation may cause conflict contagion, and friendship ties between team members may act to engage "positive" members in the initial conflict. These observations are also consistent with the concept of informational mimetism (Deutsh and Gerard, 1955), when an individual imitates others because they are supposed to be better informed. The first individual would evaluate his/her beliefs by comparing them with those of their reference group (Festinger, 1950) and later conform to the beliefs of the group (Hochbaum, 1954). Accordingly, recently-hired junior consultants, called "apprentices", learn about the existence of conflicts from their experienced

peers. Hence, new knowledge is created on the conflicts toward IT by using the process of interactions, observing, discussing, analysing, spending time together or living in the same environment. Hence, coalition formation acted on two levels at Efficient Innovation Corporation: (1) between junior consultants and experienced consultants on one side, and (2) in-between experienced consultants on the other side. At this stage, I compared these findings with those issued from the internal documentation analysis to answer the first question that I left at the end of cycle one. Then, like in Cycle 1, I performed data respondent validation, which involved cross checking my research findings with the respondents with which I have done unstructured interviews. Additionally, following respondent validation, I have shared the findings with the members of the "validation group" to discuss the research undertaken until this stage, and to exchange on the findings within the context of the research environment. Between the main discussions, the group members argued that they have already suspected that the employees at EI have been negatively "influencing" each other, but they did not know exactly "how and when" and to what extent this behaviour impacted the organisation. Accordingly, they were interested in learning that my findings provided more in-depth details in this sense.

- **F2. Emotional and Behavioural Contagion and F3. Threats to Individual and Team Outcomes**

Emotional and behavioural contagion factors, as well as factors of threats to individual and team outcomes, were observed in Cycle 2 on two levels: (1) in-between experienced consultants on one side, and (2) between junior consultants and experienced consultants on the other side. In addition to coalition formation, the negative emotions toward the ERP that were present also lead initially uninvolved team members to become behaviourally involved in the conflict. More specifically, during a meeting that gathered fifteen experienced employees with the psychologist, my observations revealed that when P2 and P3 argued with "approach" (Russell, 1978). They argued that the top management should, as soon as possible, design formal training sessions to help them quickly capture the potential of the SX, and prevent the firm from "collapsing", following the massive recruitment of consultants during the past year. The purpose of the meeting was to perform a brainstorming with key employees at EI from different subsidiaries to identify the most urgent needs concerning SX and define an action plan to solve the problems surrounding the system as soon as possible. I participated in the meeting as an observer and noted both verbal and nonverbal behaviours of the participants. P9 from Montpellier agreed with P2 and P3, putting in question the "poor strategic orientations"

of both the DG and the HR manager, because they decided to double the staff without pre-calculating whether the firm was able to afford the massive expansion without the necessary tools to do so (such as "a trustworthy ERP" and a connected brand-new Customer Relationship Management (CRM) system). During the same meeting, my observations revealed that several experienced consultants that initially kept their silence joined the discussion with the psychologist, behaving in the same "negative" way as their peers. Among the major discussions expressed in this sense, I noted the following:

> *"They (the top management) should have asked us our opinion before massively recruiting THE WHOLE PLANET!!" (P9)*

> *"RIGHT! Now it's maybe too late! I'm afraid it wouldn't be possible to enhance SX this fast. I imagine we can't fire the recently-hired consultants neither! I think we're heading right toward THE WALL!!" (P8)*

> *"It isn't possible to implement a new ERP at the moment. The only solution is to make training sessions to all junior consultants in the firm, but I don't guarantee this would work!" (P2)*

> *"NO it wouldn't work this easily!! The problem of SX is not only linked to the lack of training. The top management should understand that no one will invest his time filling SX with accurate and full information if it's not counted as production time!" (P10)*

> *"P10 is right guys. If the direction wants us to invest time in filling SX, this time should be valued and counted as production time!" (P1)*

Consequently, when conflicts arose during the meeting, negative emotions occurred. This observation is consistent with Jehn et al.'s (2013) and Bodtker and Jameson's (2001) assumption that conflicts lead to negative emotions, such as frustration, resentment, anger, and approach. These finding confirmed Jehn et al. (2013)'s and Van der Vegt et al.'s (1998) assumption that outcome interdependence is central to teams and leads employees to feel a sense of responsibility for the organisation's work (F3. Threats to individual and group outcomes). In other words, the experienced consultants' statements reflected a defence of own

and team outcomes, which in turn lead to conflict contagion, as an increasing number of colleagues become behaviourally involved in the initial conflict.

Accordingly, my observations revealed that these negative emotions were spread to other team members through threats to group outcomes and the process of emotional contagion (Jehn et al., 2013; Barsade, 2002; Kelly and Barsade, 2001) and acted to heighten their behavioural involvement in the initial conflict. Moreover, my observations confirmed Barsade's (2002, p. 650) argument, on emotional energy, where *"a high-energy display of positive or negative emotion may also transfer emotion more powerfully because it communicates the emotional message more clearly and accurately than a low-energy display."* Indeed, the more a participant raised his voice, the more other individuals were encouraged to join the conversation and express themselves out-loud, therefore adhering to the initial conflict. The relationship between emotional contagion and behavioural conflict involvement is supported by the psychology literature which posits that emotions may manifest themselves in actual behaviours (Morris and Keltner, 2000), albeit under-researched in information systems research.

On the other hand, the data collected from the informal conversational interviews with junior consultants in Paris (n=4), revealed that the employees engaged passive resistance behaviours that aimed at slowing down changes toward another IT tool at EI, that is, the PMT. I decided to conduct unstructured in-depth interviews with the four consultants, which were the same individuals with whom I did interviews during Cycle 1, in an attempt to understand why did they make several references toward the ERP while my inquiry was initially about the PMT. Understanding this situation served to answer the first question left at the end of the first cycle.

Accordingly, junior consultants were "contaminated" by experienced consultants that have been repeatedly and explicitly expressing conflict behaviours toward the ERP system. More specifically, through behavioural contagion mechanisms (Jehn et al., 2013), the conflict involvement of junior consultants was not only toward the initial subject of conflict (the ERP) but to the very "state" and behaviour of being in conflict (resisting to technology in general). For instance, when I asked P4 why did he refuse to test the PMT and provide feedback to Mr Dupont when he asked him to do so, P4 argued that he was "overbooked" and did not have time to test the tool. Then, I asked him why didn't he just ask his manager to free some time for him to test the tool, he stated the following:

> *"I knew my manager wasn't a fan of wasting time in testing unproductive technologies at EI. For example, my manager himself, doesn't stick to the deadlines of filling SX before the 5th of the month!" (P4)*

moreover, the following:

> *"So, I figured it was okay that I do the same and just say no to Mr Dupont." (P4)*

Similarly, the data collected through the unstructured interviews with the other three junior consultants in Paris revealed that they were affected by the IT conflict intensity at EI, that is, they have been involuntarily involved in the conflict. The three consultants stated the following:

> *"Since I've arrived at EI, I see people complaining of any new IT project, such as NetExplorer, Clicface, Skype Entreprise, and many many other tools. I figured these tools weren't important after all and time-consuming, so I decided not to prioritise testing the PMT at that moment." (P6)*

> *"I didn't reject the PMT; I just didn't want to ask my manager to free me some time for such a silly thing! I knew he wouldn't necessarily agree to do so because I know it's not his priority neither." (P7)*

> *"All colleagues and managers refute IT tools at EI. Just look at NetSync and SX. I figured I didn't want to say yes to Mr Dupont and provide him with feedback, and later never using the PMT." (P5)*

Thus, IT conflict contagion had succeeded to compel employees to support their peers in their conflict toward the ERP and thereby to join them along conflict lines (Jehn et al., 2013) and to express conflict behaviours toward the PMT. Moreover, by resisting toward the PMT, the junior consultants had an additional opportunity to comply with their physically-close colleagues. This observation is consistent with the findings of Greer and Jehn (2007a), Yang and Mossholder (2004), Lee and Allen (2002), Barsade (2002), and Bodtker and Jameson

(2001) on behavioural contagion, that is, behaviours are spread through individuals by simple exposure.

On the other hand, the interviews made with junior consultants in Montpellier revealed that prior exposure to failure with the firm's ERP is the reason they did not want to *"hear about any other IT tool in the company".* This finding was consistent with Martinko et al.'s (1996) assumption that an individual's attributions are formed and evolve during and after IT implementation. For instance, in the case of the PMT, the attributions may take their form from a generalised attributional scheme based on what the individual interprets to be related prior experiences (Gioia, 1986). However, if a person already had some experience with a specific technology, these attributions will be more finely articulated and will more specifically reflect actual IT experiences. Accordingly, the four junior consultants stated the following:

> *"Every time I have to use the ERP, I should spend too much time on it. Technology is complicated! I honestly have no time to hear someone talking about a new IT (DST). It smells complications, just like the ERP!" (P13)*

> *"I tried many times to learn by myself how to create new assignment sheets on SX and It never worked! I couldn't just accept to start using the PMT without any prior training or communication with Mr Dupont on the matter!" (P11)*

> *"I cannot go on and waste my time trying to learn how to use a new IT tool. This is why I thought of SX last time we spoke because I had a similar experience with SX!" (P12)*

> *"IT acceptance require rigour in communication between the firm and its employees, which wasn't the case neither with the ERP nor with the PMT!" (P10)*

However, my findings contribute to Martinko et al.'s (1996) IT attributional model, that is, the interviewed individuals engaged passive resistance behaviours toward an IT tool with different characteristics and objectives than the ERP. Indeed, the ERP was a 'ready-to-use' enterprise system aiming IS integration, whereas the PMT was an Excel-based application

helping consultants make decisions. In other words, resistance contagion seemed to be an opened phenomenon where projects' characteristics are not the keystone.

- **F4. Behavioural Lock-In**

Lock-in mechanisms can occur in behaviours. For instance, Barnes et al. (2004) call these mechanisms behavioural lock-in, where an individual's behaviour becomes locked-in because of habits, learning or culture inhibiting the firm in which he works. Moreover, behavioural lock-in is defined in the psychology literature as a situation of behavioural irreversibility due to learning and habitation (Davis, 2015). Such situation occurs when the behaviour of an individual is "stuck" on a non-optimal path because organisational culture is preventing the change. Nevertheless, the findings of the second cycle revealed a similar, yet a new lock-in phenomenon, which I call "IT Resistance Behavioural Lock-in". More specifically, this phenomenon occurs when the resistance behaviours of an individual toward IT are "stuck" due to his/her prior exposure to resistance behaviours that happened in the past toward an IT system, which presently and continuously make the individual resist toward any new IT. Moreover, "IT Resistance Behavioural Lock-ins" are highly "contagious", as individuals capture the conflict behaviour of others through emotional and behavioural contagion and coalition formation. At the organisational scale, the same phenomenon is called "IT Resistance Path Dependency". It is a process in which an organisation faces the same state of "illness" from resistance behaviours toward IT in general all along its path due to prior resistance behaviours toward an IT system that occurred at a certain point in the firm's history.

In cycle two, I did an informal conversational interview with the experienced consultant (P14) in Montpellier that had been in charge of IT maintenance at EI since the deployment of the ERP in 2009. The data collected from the interview revealed that before 2009, the firm's employees used excel sheets developed by the company's President to declare assignment sheets, presence sheets, as well as to do basic accounting tasks, such as invoices. He stated that during the 2008 world economic crisis, the director-general decided to implement an ERP in an attempt to monitor the firm's operations and enhance operational efficiency. However, according to P14, EI's President resisted to the deployment and insisted on using his own excel sheets to manage operations. Moreover, many managers actively resisted the project stating that the selected ERP was the least efficient and the most complicated to use. Consequently, the DG decided to force the implementation making consensus in 2010 on the ERP project. He encouraged those who resisted the project to use the ERP progressively, starting with the most basic functions, and giving the time needed for everyone to get used to it before using other

complex functionalities. Then, according to P14, six years after the ERP implementation, everyone was still using the same basic functions as before, and that, only partially. Moreover, P14 stated the following:

> *"6 years following SX's deployment, our president today uses his self-made Excel sheets, and pays someone to fill the data in the ERP." (P14)*

Similarly, many managers continue to use SX, but only partially, as *"they can't find any other way to monitor the daily activities of the firm"* according to P14. That said, the very same individuals are reluctant to use it because they do trust the reports issued from it, that is, the information filled was not accurate. These observations show that one can use IT and resist it at the same time. P14 later added that the firm's culture has been witnessing indifference behaviours and passive resistance behaviours, transmitted from "old" consultants to experienced consultants, and then to junior consultants. As a consequence, because of these conflicts, EI today resists *"toward any new technology to-be-implemented in general"*. Then, I took the opportunity to ask P14 whether he thought that the PMT deployment project failed because of this, he argued the following:

> *"The ERP conflict experience is one of the major reasons for which, any new technology that may be perceived to affect the firm's processes or how things work, such as the PMT, NetExplorer, or even a new coffee machine, would automatically witness rejection." (P14)*

Accordingly, this statement reflected a boycott situation at EI to abstain from using any IT tool at the firm. Again, at this stage, I performed data respondent validation, which involved cross checking my research findings with the individuals with which I have done unstructured interviews. Additionally, following respondent validation, I have shared these findings with the members of the "validation group" to discuss the research undertaken at this stage, and to exchange on the findings within the context of the research environment. Accordingly, my findings during Cycle 2 answered my research questions raised in Chapter 2:

Research Question 1: *What if an existing system in the firm is witnessing resistance behaviours – is it likely to impact the new to-be-implemented-system because of contagion*

phenomenon? Could conflict contagion occur between successive dissimilar IT projects (e.g., different IT tasks, users, objectives, etc.)?

Research Question 2: *Do "negative" past, and present behaviours infect the "positive" behaviours of users engaged in a new project?*

Indeed, these findings answer these research questions as it appears that the firm's conflict experiences toward the ERP are contagious and infect other individuals working on a new different IT tool (the PMT) with distinct objectives, users and functionalities.

Between the major discussions engaged during the "validation group", the members agreed that it would not be possible to migrate to another ERP system at that moment, and thus, it would be necessary to design formal training sessions on the ERP in an attempt to solve the problem. Accordingly, the HR manager and the DG decided to design a web-based and user-friendly SX training platform that includes small video-based training exercises for newcomers. According to the DG, the purpose of the E-learning platform would be to provide recently-hired employees and junior consultants at EI with the necessary "tools" to help them learn the most important tasks related to SX. The DG added that such an online-based user-friendly interface would encourage newcomers to "dive" through SX, clearing the obstacles associated with the tool's poor ergonomics and complicated interface. The HR manager agreed with the DG and argued that designing such an E-learning platform could be made in four to six months, with low costs, because it would just require hiring an intern who is specialised in the domain. Additionally, the HR manager posited that the online training sessions would assure that all the ERP tasks "required" by the management would be included, because *"now we know what we need regarding functionalities to get the firm back on the right track"*. As a consequence, the DG asked Ms Lepoux to take care of this side of the project.

Nevertheless, my matrix (see Table 39, p. 170) had put forward issues as for resistance behaviours identified during the second cycle. More specifically, my findings revealed that another IT in the firm was impacting the PMT project through conflict contagion. During the same meeting, the DG was surprised by the results of the "IT conflict contagion matrix", and argued being very concerned about the conflict contagion issue associated with IT at EI. Hence, he wanted me to start a third and last cycle, shorter than the other two cycles, and look for a research-based management method that might stop conflict contagion, as well as reattempt to deploy the PMT. However, the DG argued that I should take into account the consensus that we agreed on at the end of Cycle 1, that is, to leave the choice for experienced consultants

whether to use it or not. However, he also added that my challenge was rather to encourage newcomers to use the PMT, without using a "forcing" strategy, as he was afraid it would contribute further to the "negative image" of IT at the firm. Finally, the DG gave me a limited time-frame to "operate", arguing that by the end of 2016, the AR project should be finished. Hence, we agreed on ending Cycle 2 and starting a third and last cycle which lasted six months.

The following section details Cycle 3. It discusses the selection, use and learnings of a theoretical-based approach for conferring resistance to attitude change, called Inoculation Theory. The table below provides a summary of the main activities made collaboratively in Cycle 2 as well as the main findings and learnings obtained at the end of the cycle. These findings are the key factors that induced the third action research cycle.

Action taking	• Developing an "IT conflict contagion matrix" to enquire about the evolution of intra-team resistance behaviours toward different projects in the firm's IT portfolio; • Developing a conceptual research model that illustrates a possible "IT conflict contagion" between two distinct IT projects; • Performing an analysis of an internal document on the objectives of the "Innovation Academy"; • Conducting a total of 14 informal conversational interviews with both experienced and junior consultants at two different EI subsidiaries; • Validating the interpretations through several "Validation group" sessions.
Evaluating	• Junior consultants joined the conflict along with their experienced peers because they were socially and professionally "attracted" to them; • Because of "IT conflict contagion", junior employees tended to support their experienced colleagues in their conflict toward the ERP; • As a consequence, junior consultants joined their colleagues along conflict lines, and engaged conflict behaviours toward both the ERP and the PMT; • Experienced consultants exchanged active discussions on the conflict issue with their "private support networks" leading to extending the conflict situation to other experienced consultants that were not previously engaged in the initial conflict.
Specifying learnings	Emotional and behavioural contagion factors, as well as factors of threats to individual and team outcomes, were observed in Cycle 2, on two levels: **1.** between experienced consultants on one side; and **2.** between junior consultants and experienced consultants on the other side. • "IT Resistance Path Dependency" occurred, which is a process in which EI faced the same state of "illness" of IT resistance behaviours, due to prior conflicts on the firm's ERP, all along its path.

Table 40: A Synthesis of the findings of Cycle 2

3.3 Third Action Research Cycle

Cycle 3 (04/16 – 10/16, six months)
Objective: • Identifying a theoretical-based change management approach to stop the IT conflict contagion process that had been affecting the PMT project; • Simultaneously deploy the PMT in the firm at a large scale, while "protecting" recently-hired employees from resisting the PMT implementation because of IT conflict contagion.
Key sources: • Academic literature on resistance to attitude change; • Participant observations during two PMT training sessions with 12 and 15 participants; • 14 semi-structured interviews with participants of the training sessions.
Data analysis: During several sessions with key employees at EI, direct observations, verbal and non-verbal communications were noted.

3.3.1 Design (Cycle 3)

The third cycle (April 2016 – October 2016) was to identify a theoretical-based change management approach to solve the IT conflict contagion organisational problem at Efficient Innovation Corporation that has been affecting the usage of the PMT. Then, the purpose was to apply this theoretical approach through training sessions on the PMT for recently-hired management consultants. Consequently, the main objective of Cycle 3 was to reattempt to deploy the PMT in the firm at a large scale, while "protecting" recently-hired employees from being "contaminated" by their peers, thus preventing them from resisting toward the implementation project because of IT conflict contagion. The third cycle therefore partially followed a research-dominant approach (Chiasson et al., 2009) by using, as a prime source, literature on how attitudes and beliefs change (McGuire and Papageorgis, 1961), and more essentially, how to make existing "positive" attitudes and beliefs resist (Fagnot and Stanton, 2015; Compton, 2013; Compton and Pfau, 2005) to external persuasion attempts (Lumsdaine and Janis, 1953). Cycle 3 also partially followed a problem-solving approach (Chiasson et al., 2009) by implementing the training sessions, which was explorative and consistent with thematic analyses in which codes were constructed inductively. Regarding **action planning**, I identified Inoculation Theory (McGuire, 1964) as a particularly suitable approach to "fight" IT conflict contagion mechanisms identified in Cycle 2.

Accordingly, the Inoculation theoretical framework provided the foundations to design PMT-training sessions for recently-hired employees at EI, assuming that these individuals would have "positive" attitudes toward the tool, that is, they have not yet been "contaminated" by other employees in the firm.

Regarding **action taking**, my contribution was to develop an IT-training methodology based on the principles of Inoculation theory which contrasts with "traditional" training sessions in that it involves encouraging participants to "think for themselves", rather than simply showing them how to perform an IT-related task. I also developed and tested a conceptual research model of the impact of an Inoculation intervention on individuals, after exposure to IT conflict contagion, regarding Inoculation subjects' resistance to attitude change (see Figure 21, p. 85).

McGuire's (1964) Inoculation Theory, is a way to manage resistance to attitude change. Attitude is the concept of having an opinion about a given situation or circumstance weighted by the personal evaluation of this view. In my case, recently-hired consultants (newcomers) were the targets of carefully designed Inoculation messages that ought to maximise the strength of their existing "positive" attitudes and enable them to refuse to embrace IT resistance messages that were attitudinally dissimilar. Accordingly, the goal of the third AR cycle was to examine whether inoculation messages helped management consultants at EI to maintain pre-existing "positive" attitudes toward the PMT while guarding against undue conflict contagion from negative messages that these consultants may have heard from their colleagues. With the help of the manager of the R&D PPM department Mr Dupont, and the firm's psychologist Ms Lepoux, I designed two training sessions on the PMT tool for total twenty-seven participants, between which, twenty-three consultants were recently-hired (less than six months at EI). Also, I intentionally invited the four experienced consultants from the PMT "detractors" group to the sessions (two individuals at each session), as I figured it was interesting to see how individuals with "negative" attitudes reacted to the "vaccine". In other words, I wanted to enquire about how they reacted to Inoculation on a later stage, knowing that they had developed "negative" attitudes toward the PMT. The training sessions lasted one day each (including lunch and coffee breaks) and took place in Montpellier and Paris. I played the role of a participant observer while Mr Dupont was in charge of providing the technical training as well as orally expressing the Inoculation message several times during each session.

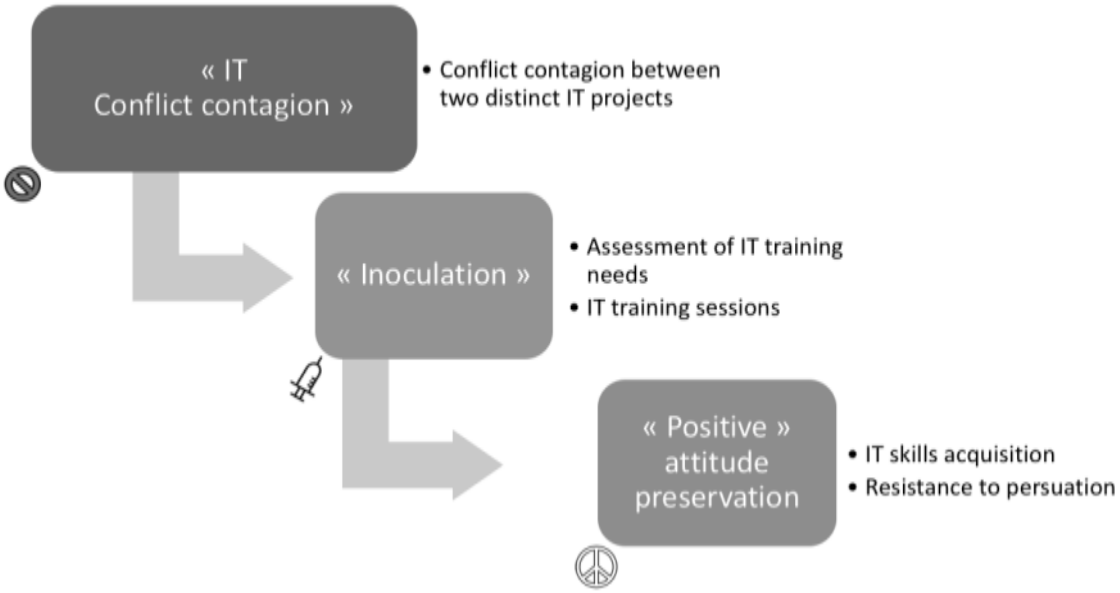


Figure 36: The Process of "Positive" Attitude Preservation

The process that I followed to design the training sessions (see Figure 36) first involved an assessment of training needs. Accordingly, I relied on the internal document analysis that I made to capture the task-oriented difficulties expressed by the respondents that participated in the survey made by the firm's psychologist. Additionally, the assessment comprised the following tasks performed in Cycles 2 and 3:

- Observing employees performing R&D PPM assignments on a daily basis over a period of 15 months;
- Informal conversational discussions with these employees and with Mr Dupont;
- Studying routine reports and assignment reviews;
- Identifying R&D PPM assignments efficiency issues.

Along with the R&D PPM department manager, Mr Dupont, and the firm's psychologist Ms Lepoux, I defined the training program's learning objectives based on the assessment of the training needs. Also, the learning objectives were derived from the needs of both top managers and management consultants regarding CIR assignments efficiency gain. The objectives would serve to specify observable and measurable actions that each participant and top manager would be able to demonstrate as a result of designing and participating in the two training sessions. During the implementation of the training sessions, I played the role of a participant observer. The training sessions included real-life scenarios of selecting R&D projects in a client's portfolio to shed light on the complexity of such assignments. This was based on Klein's postulate (1998) that when individuals are already familiar with a given

situation, they would immediately be able to select a workable course of action based on their experience. In the context of R&D PPM assignments, the new management consultants were familiarised with potential complex situations and on how they may handle them in advance. Although providing technical training on the tool and the R&D project selection process cannot ensure 100% smooth assignments, it is better having neither preparation nor advance discussion of decisions and issues that will undoubtedly arise in a complex assignment. Moreover, to apply Inoculation theory when developing new IT training sessions, I needed to generate threats through discussions on salient examples of assignment complexity. Respectively, research on adult education posits that *"adults are motivated to learn as they experience needs that learning will satisfy"* (Knowles et al., 2005, p. 39). Thus, I focused on establishing a threat's existence by discussing real-case scenarios which show participants that they need to learn about these situations and, thus, should ameliorate their learning.

According to McMahon et al. (1992), the most suitable disposition for training groups of between ten and thirty persons is to sit down in a "U" shape as they would be able to easily interact with the trainer with a minimum risk of distraction. I used this disposition to assure that the participants would receive the Inoculation message. Accordingly, below is the configuration of the seats on which participants were seated (see Figure 37).

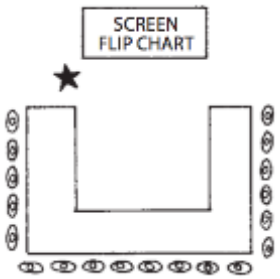


Figure 37: Participants' Disposition during the PMT Training Sessions (McMahon et al., 1992)

"*" represents the trainer, Mr Dupont, and the oval forms represent the participants. Each training session began with a friendly chat between Mr Dupont and the participants to create a comfortable environment. Then, Mr Dupont made a formal introduction as of the objectives of the session, summarising its main points. Table 41 below details the mixed-training methods process used.

Action	Description	Medium
Lecture	- Passing on information and facts on the CIR eligibility criteria; - Giving accurate information related to the complex tasks that management consultants should fulfil in R&D PPM assignments; - Presenting the Portfolio Management Tool regarding advantages and usage guide.	PowerPoint Presentation
Discussion	- Stimulating interest and thought on the advantages of computer-assisted R&D project selection using the PPM; - Generating instant solutions to any obstacle that might arise during the debate; - Developing instant consensus if possible.	Oral interaction
Case study	- Identifying real-case R&D PPM assignment problems; - Solving the identified problems using the PMT; - Refutational preemption based on the "negative" story as of the impact of false or inaccurate R&D eligibility screenings.	PowerPoint presentation and oral interaction
Inoculation	Stating the Inoculation message.	Oral interaction
Role-playing	- Developing team and interactive knowledge on the R&D PPM process; - Introducing humour and "liveliness" through prior success stories of R&D PPM assignments achieved by employees that used the PPM.	Oral interaction
Demonstration	Showing correct procedures and required standards induced by the new R&D PPM process and the PMT.	PowerPoint Presentation
Inoculation	Stating the Inoculation message.	Oral interaction

Table 41: Inoculation-based IT Training Program

According to Compton and Pfau (2005), Inoculation messages should depend on two principal elements to work: threat (also called forewarning) and refutational preemption. For instance, the threat is defined as *"a warning of possible future attacks on attitudes and the recognition of attitude vulnerability to change"* (Szabo and Pfau, 2002, p. 235). In my case, it was generated through an oral warning after each key learning milestone during the two training sessions. The warning was that some employees at Efficient Innovation Corporation, even very "good" ones, think that using the portfolio management tool would slow them down and that someone could attempt to convince them that it is not necessary to follow all the new R&D project selection process as advised. Then, refutational preemption, which Szabo and Pfau defined as *"the process of replying to counter arguments before they occur"* (p. 235), gives recently-hired management consultants the tools (e.g., refutations) to use against future attacks. It also provides them with practice on how to generate their tools. Relative to my case, a refutational preemption might occur when a negative story is told to a newcomer about the impact of delivering a wrong or inaccurate R&D projects eligibility screening on both EI and

its clients. For example, one negative story was about a client firm that was controlled by the French government, which later proved that the consultant's eligibility screening was inaccurate. Consequently, this had put the client in serious financial trouble causing him to reimburse the already received research tax credit and caused EI to lose a major client. The recently-hired consultant could then use this anecdote (e.g., refutation) when s/he encounters colleagues who do not trust that the PMT must be used and the new selection process shall be followed exactly. The employee would also have the tools for dealing with the threat by pointing out the company's value statement that the client firm's safety and empowerment are number one. Furthermore, hearing this "negative" story might make the new employee to think of additional motives why s/he wants to use the PMT. As a result of figuring his/her reasons, s/he will be armed both with the refutation given to him during the Inoculation-based IT training session (the anecdote) and his refutations that s/he had formulated in advance of a confrontation.

The planning of the Inoculation intervention was conducted in two phases. During the first phase, which I call "Post-treatment Phase", was the phase of training sessions, all participants were exposed twice to "treatment" as of expressing the Inoculation message two times (ones after the case study, and two after the demonstration, see Table 41). The following is an excerpt from the Inoculation message expressed by Mr Dupont who was in charge of performing the training:

"We have exposed the strategic advantages of using the PMT to you. We also worked together to understand better the best practices for using it more efficiently. However, Hey! Beware! You will certainly hear some of your colleagues complaining that the PMT slow them down, is ergonomically ugly or even useless. However, remember that we can put our clients in serious financial troubles if we provide them with inaccurate, disorganised, undocumented or wrong R&D eligibility screenings. This could cause us losing valuable clients as well. Now you now know you can prevent such a serious problem, and that the PMT is the reason why more and more clients are hiring us. It is also a mean for you consultants, to work less, and produce more!"

Right after each training session, I conducted informal discussions with each of the selected participants in an attempt to assess their attitude, in its three components, toward the PMT. The second phase, which I call "Post-attack Phase", started approximately one month after the conclusion of the first phase. I waited two months following the Inoculation-based IT

training sessions before I interviewed the participants in an attempt to give enough time for the employees to be "attacked" by their colleagues that had "negative" attitudes toward IT tools at EI. I would have provided more time if I could. However, I was pressured by the top management to deliver feedback on the training and Inoculation intervention, and end the AR project before the end of the year 2016. Nevertheless, although scholars argued that a moderate delay between Inoculation intervention and attack is ideal for conferring resistance, study results have been inconclusive (Banas and Rains, 2010). For instance, Pfau et al. (1990) argued that there is no significant difference in resistance to persuasion when an intervention is done before or after a counter-attitudinal attack. In other words, unlike medical vaccination, which requires that the Inoculation precede a human body's gaining resistance, the authors posited that psychological vaccination against persuasive messages does not necessarily require an identical chronological flow. The semi-structured interviews with the participants aimed to verify whether the training sessions participants have developed counter arguments as a strategy of established attitudes-maintenance toward the PMT. Hence, counter-arguing served as manipulation check variable. The variable was assessed in the second phase of the study through explorative face-to-face semi-structured interviews consistent with thematic analyses in which codes were constructed inductively (see Figure 39, p. 201). Below, I detail the findings with respect to the manipulation check variables.

- **Perceived Threat, Counter-Arguing and IT usage**

To answer my research question n°3 *"Could an Inoculation intervention during IT implementation reinforce "positive" individuals' resistance to attitude change?"*, along with the explicit statements of my participants, I have also noted my observations of their affective and cognitive attitude components (LaPiere, 1934) toward the threat subject. The purpose was to assess attitude using in-depth qualitative data collected during the semi-structured interviews. Then, the participants' counter-arguments were evaluated via a "Thought-Listing Technique" (Petty et al., 1976) successfully applied in prior quantitative Inoculation research work (e.g., Pfau et al., 2009). This technique is a social psychological method for cognitive response evaluation to gather the cognitive responses of human beings. After exposing individuals to a message, the researcher asks his/her interviewees to state the thoughts that ran through their minds during question presentation. The Thought-Listing Technique requires that information about cognitive reactions be deduced from comparisons between data (Cacioppo et al., 1997) obtained from measurement occasions or groups (e.g., thought listings from the same individual in different circumstances or from individuals from known specific groups). For

example, considering a situation in which individuals are presented with behaviours that are somewhat ambiguous about whether they implicate hostility, such as, *"I do whatever I think it is right for me, no one has the right to interfere in my business!"*. Then, each is invited to describe the reasons for this behaviour and, afterwards, to state everything about which s/he had been thinking. If the individual is hostile and the concepts of hostility, interpersonal threats, and conflict are instead relatively accessible in memory, *"then the individuals may be more likely to list thoughts indicating a sense of being unfriendly, hostile, or excluded in response to the scenario"* (Higgins et al., 1982; Smith and Branscombe, 1988) in this assessment context that other possible accounts. Accordingly, each thought is then examined to enquire about whether respondent responses are consistent or inconsistent with the message and ultimately how effective a particular message may be. For instance, I asked my interviewees to state all the arguments on the PMT contrary to their positions, regarding their perception of the PMT's technical issues, or the loss of autonomy because of using the tool. Moreover, I asked them to state all of their arguments in support of the PMT. The assessment of counter-arguments was derived by "weighting" regarding attitude valence all the arguments provided by the respondents in support and opposition of the PMT. Hence, I attempted to assess counter-arguments using in-depth qualitative data collected during the semi-structured interviews.

Accordingly, as **an action taking**, to answer my third research question, I conducted twelve semi-directive interviews with six participants from each training session to assess their level of perceived threat and counter-arguing, but also assess attitude change in its three components. The behavioural component was of greatest interest to my study as I attempted to determine whether their attitude of PMT-use was modified or maintained. The assessed cognitive component was about their general thoughts and beliefs about the attitude object, the Project Management Tool. These interviews were open, in the sense of allowing new ideas and questions to be brought up during the interview as a result of what the participants were saying. I listened to my respondents and did only a little talking. The interviews were carried out in a face-to-face format with an anonymous format of response gathering. The interviews followed a general framework of topics to be explored (see Table 42 and Table 43), and lasted around 45 minutes each during which I have noted the respondents' main statements. I completed this analysis by several informal discussions with the same individuals and other junior consultants at EI.

Introduction aspects	
Thank you	I want to thank you for taking the time to meet with me today. I would like to talk to you about your experiences with the PMT if in case you are using it in your R&D PPM assignments. I am assessing users' satisfaction of the tool in a continuous effort of improving the training sessions for newcomers. The interview should take less than an hour. Please be sure to speak up so that I don't miss any thought. All responses will be kept confidential. This means that your interview responses will only be shared with my PhD director and I will ensure that any information we include in my report does not identify you as the respondent. Are there any questions about what I have just explained?
Purpose	
Anonymity	
Duration	
How the interview will be conducted	
Opportunity for questions	
Core questions	
Five open-ended interview questions (IQi)	- IQ1: Do you often get to use the PMT in your R&D PPM assignments? - IQ2: What are, in your opinion, the main disadvantages of using the PMT? - IQ3: What about the tool's advantages? - IQ4: Do you often hear your colleagues complaining about the PMT? - IQ5: Do you ever feel you will someday abandon the tool because of this?
Closing aspects	
Additional comments	Is there anything more you would like to add? I will be analysing the information you and others gave me and submitting a draft report to the organisation very soon. Thank you for your time!

Table 42: Framework of Topics to be Explored During the Interviews in Cycle 3

Subsidiary	**Group of consultants**	**Number of interviews**
Paris	Experienced	2
	Junior	4
Montpellier	Experienced	2
	Junior	4
Total unstructured in-depth interviews		12

Table 43: Semi-Directive Interviews Conducted in Cycle 3

When each category of the identified attitude components was conceptually dense (Strauss and Corbin, 1998), variations in the category have been explained, and no further data in line with the categories emerged during data collection. In other words, when all my respondents from the two groups of consultants were expressing the same ideas over and over, and nothing new was emerging from my observations in the field, I assumed that no additional

interviews were necessary because of data saturation. Table 44 below cites the initials of the interviewed employees.

Participant (Pi) codes	**Function**	**Subsidiary**
P3	Experienced consultant	Paris
P2	Experienced consultant	
P15	Junior consultant – Newcomer	
P16	Junior consultant – Newcomer	
P5	Junior consultant – Newcomer	
P17	Junior consultant – Newcomer	
P8	Experienced consultant	Montpellier
P1	Experienced consultant	
P18	Junior consultant – Newcomer	
P19	Junior consultant – Newcomer	
P20	Junior consultant – Newcomer	
P21	Junior consultant – Newcomer	

Table 44: Codes and Groups of the Interviewees in Cycle 3

Like in Cycle 1, to avoid potential biases of data interpretation, I directly noted their main statements and my analysis on a sheet of paper and asked my respondents whether my interpretations seemed to be representative of their beliefs. I also partially used Nvivo software to synthesise codes and classify the data collected. Table 45 below shows the codes and categories identified at the end of Cycle 3.

Attitude component	Category (attitude valence)	Codes used during data analysis[19]	Group of employees
Affective	Positive attitude valence – PMT as a tool for feeling safe	Tolerance for others to use the PMT; Feeling threatened if PMT is not used; PMT evokes a feeling of safety.	Both junior and experienced consultants
	Negative attitude valence – PMT is not technically sure	PMT evokes a feeling of being afraid; PMT is not trust-worthy.	
Behavioural	Positive attitude valence – PMT is used or will be used	Will continue to use the PMT.	
	Negative attitude valence – PMT is not used or will stop to be used	Will not use the PMT.	
Cognitive	Positive attitude valence – PMT as a way to help consultants with their tasks and is appreciated by clients	PMT potential; PMT is helpful; PMT is appreciated; PMT is interesting; PMT saves time.	
	Negative attitude valence – PMT is risky and causes waste of time	PMT has no advantage; PMT is useless; PMT is not valuable; PMT slows down tasks; PMT is not accurate; PMT is risky to use.	

Table 45: Codes and Categories of Attitudes Identified at the End of Cycle 3

In Cycle 3, I have identified six categories of attitude valence, established "positive" attitude, and opposed "negative" attitude, manifested inductively by the twelve interviewed participants that consisted of junior consultants (newcomers) mostly and a few experienced consultants. The individuals' attitudes were studied in their three components (LaPiere, 1934): affective, behavioural and cognitive. For instance, the behavioural component consisted of the actions of individuals' (e.g., IT use vs IT non-use) toward the attitude object. The affective component consisted of the individuals' feelings / emotions about the attitude object (e.g., *"I am scared to use the PMT / not to use the PMT").* The cognitive component consisted of the individuals' thoughts and beliefs about the PMT (e.g., *"I believe it is risky to use the PMT / not to use the PMT").*

3.3.2 Results (Cycle 3)

The purpose of the third cycle was to assess the impact of Inoculation-based IT training sessions on management consultants with both initial "established attitudes" (in my thesis labelled as "positive"), and opposing attitudes (in my thesis labelled as "negative"), initial

[19] The codes were created by mixing the thematic coding (Miles and Huberman, 1984) and open coding (Strauss and Corbin, 1998) techniques.

attitudes. As such, it was important to confirm that training sessions participants were relevantly assigned to the two attitude groups (positive vs negative). The data collected during informal discussions with each of the selected participants revealed that the individuals were grouped according to the initial attitudes toward the PMT. More specifically, I succeeded to assess the attitude valence, which corresponded to the degree of positivity or negativity of the attitude (Whan Park et al., 2010), serving as the criterion variable in the "Post-treatment Phase". Table 46 below shows an excerpt of the main statements of each participant that referred the attitude valence.

Initials	**Extract of statements**	**Behavioural valence**	**Affective valence**	**Cognitive valence**
P3	*"The training session was indeed interesting, but I still don't see any advantage for me to use the PMT, so I don't think I'll be using the tool."*	-	+	-
P2	*"I am not using the tool at the moment, the PMT and the new process are not convenient nor relevant with how I do my assignments!"*	-	-	-
P15	*"Very interesting! Based on my experience from using the PMT, the PMT is really crucial for ensuring that we don't do things wrong!"*	+	+	+
P16	*"I will do my best to learn how to use the PMT!"*	+	+	+
P5	*"Like I do, we should all profit from the long experience of Mr. Dupont. The PMT is the fruit of his extensive knowledge of the sector!"*	+	+	+
P17	*"I now know I have something (the PMT) to rely on in order to get away if things go wrong!"*	+	+	+
P8	*"Frankly speaking, I still think it's an ugly tool, and I don't think I will be using it anytime soon."*	-	-	-
P1	*"I don't think I'll use the PMT in my assignments. I'm a fan of all the effort made to enhance the R&D selection process, but I do not agree with the utility of the tool."*	-	+	-
P18	*"I didn't know that the PMT existed at EI. I can't wait to use it!"*	+	+	+
P19	*"I have never heard of the PMT before, but it was interesting to see that we have developed such a tool by ourselves! Eager to see how it works"*	+	+	+
P20	*"I don't get to do large R&D selection assignments, but I'm interested to use it (the PMT) even in small assignments. The tool looks sexy!"*	+	+	+
P21	*"I didn't capture at first the utility of the PMT, but now that I know that someone at EI had a serious problem because he made false eligibility screening, I'm glad to know I will be able to avoid such a problem!"*	+	+	+

Table 46: Attitude Valence Assessment in the "Post-treatment Phase"

On the other hand, it was also important to confirm that, consistent with prior quantitative Inoculation research work (e.g., Miller et al., 2013; Pfau et al., 2009), Inoculation was conveniently used in its traditional sense (i.e., as a strategy of resistance to resistance, or "fighting fire with fire"). Thus, if effectively performed, inoculated individuals with initially established (in this thesis positive) attitudes should have reported an ability to provide counter-arguments as a self-defence and self-reinforcement mechanism. It remained to see how individuals with initially "negative" attitudes reacted to the Inoculation treatment. I start with detailing the results relative to the individuals that initially had "negative" attitudes. Then, under the same sections, I show the **findings** relative to the individuals that initially had established "positive" attitudes. Table 47[20] and Figure 38[21] below, show the variation of attitude components between the post-treatment phase (right after Inoculation) and the post-attack phase (two months after the end of the training sessions).

	Post-treatment phase (right after the session), Attitude Valence			**Post-attack phase (+2 months), Attitude Valence**		
Initials	**Behavioural component**	**Affective component**	**Cognitive component**	**Behavioural component**	**Affective component**	**Cognitive component**
P3	-	+	-	-	+	+
P2	-	-	-	-	-	+
P15	+	+	+	+	+	+
P16	+	+	+	+	+	+
P5	+	+	+	+	-	+
P17	+	+	+	-	-	-
P8	-	-	-	-	+	-
P1	-	+	-	-	+	-
P18	+	+	+	+	+	+
P19	+	+	+	+	+	+
P20	+	+	+	+	+	+
P21	+	+	+	-	-	-

Table 47: Variation in Attitude Components Two Months After the Training Sessions

[20] - is negative attitude valence and + is positive attitude valence.
[21] 1 is positive attitude valence and -1 is negative attitude valence.

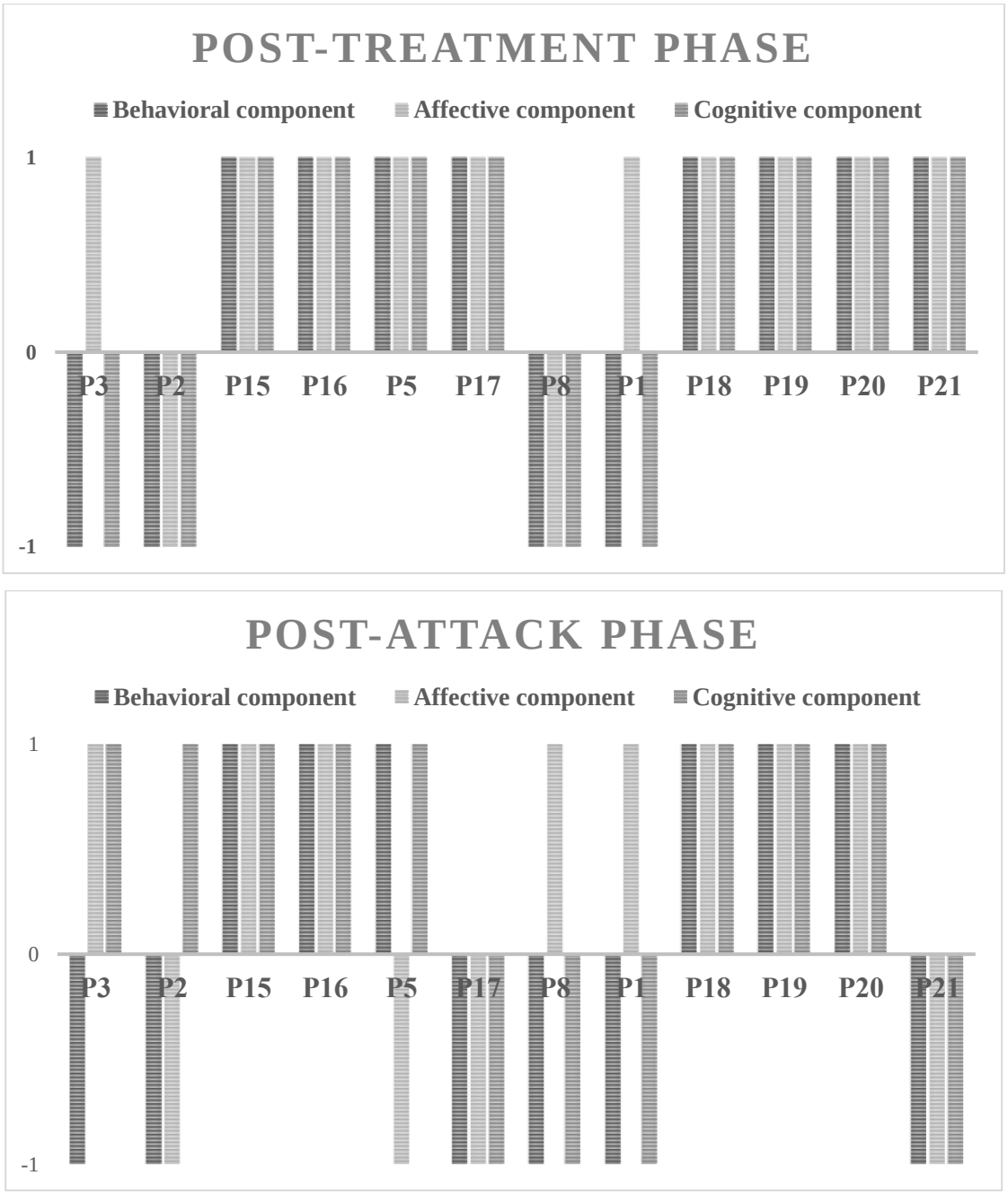
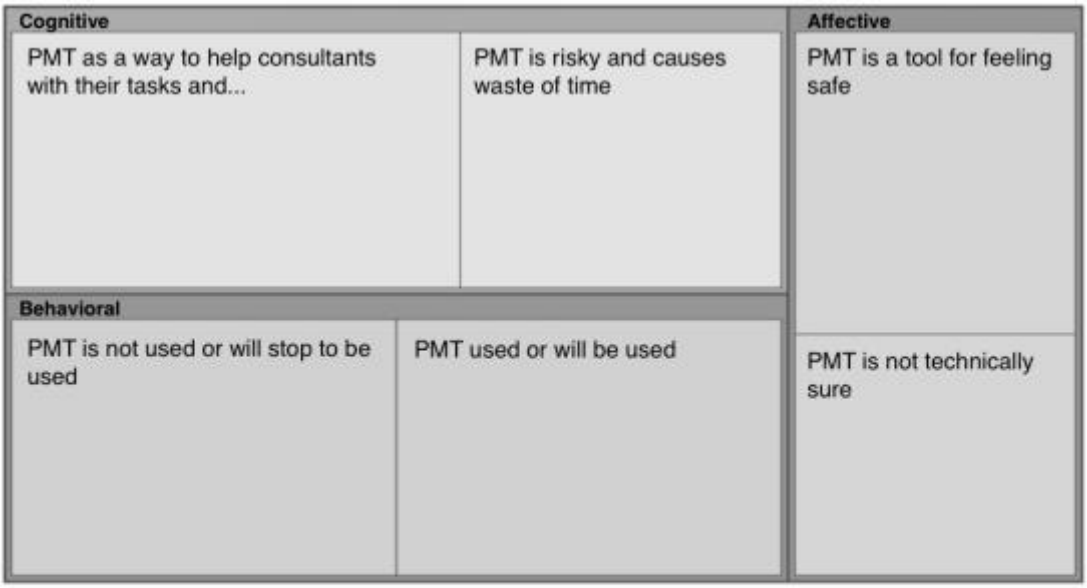


Figure 38: Graphic Representation of Attitude Valence Variations Between the Post-Treatment Phase and the Post-Attack Phase

Below is a screenshot of Nvivo's classification of codes and categories.



Nodes	Number of coding references
Nodes**Cognitive** – Negative	6
Nodes**Cognitive** – Positive	6
Nodes**Behavioral** – Negative	6
Nodes**Behavioral** – Positive	6
Nodes**Affective** – Negative	4
Nodes**Affective** – Positive	8

Figure 39: A Screenshot of Nvivo's Classification of Codes and Categories in Cycle 3

- **Individuals with Initially "Negative" Attitudes**

Although Wood (2007) posited that Inoculation might have a counterproductive impact on people with opposing attitudes, the findings in my case reflected an alternative observation. The four invited participants that had opposing attitudes did not suffer "attitudinal harm" as a consequence of receiving an Inoculation message. The same participants stated that they have not been using the PMT (Interview Question - IQ1) for similar task-oriented reasons as expressed in Cycle 1. Surprisingly, during informal discussions with the same individuals, they argued that the tool had some advantages, which justified the change in one or several attitude components' valence. For instance, when I asked these participants IQ3: *"What about the tool's advantages?"*, I noted the following statements:

> *"Even if the tool is not useful for my business, I think there's a true potential for the PMT as the clients seem to be value it. I'm glad I was able to attend to the training session with Mr. Dupont anyway." (P3)*

"I can't see any direct advantage for my assignments. But for the inexperienced consultants working here, it could be helpful if they ever understand its guidelines. Ha-Ha." (P2)

"Well I see that a few junior consultants appreciate the PMT, it must be interesting for them to use the tool. But I trust it isn't valuable to me, it slows me down actually." (P8)

"I'm not able to judge the tool's advantages as I haven't thought about them. I actually do not need the PMT. I think it's good for guys like Mr Dupont and his disciples." (P1)

Thus, the experienced consultants stated that the PMT might be advantageous for employees with little or no work experience at EI. However, no attitude change was observed two months after the Inoculation session. Indeed, these individuals still considered the tool as not useful to them and hence they maintained their opposed attitude toward it. Accordingly, attitude valence was deemed as negative in all the statements above.

Furthermore, the data collected during informal discussions with the experienced consultants revealed that the initially opposing attitudes of inoculated individuals shifted in the direction advocated in the inoculation message. In other words, the experienced consultants who were originally opposed to the PMT were more positive after the inoculation message. Respectively, I noted the following statements:

"I understand that R&D project selection assignments involve a high risk for error for both the consultant and the client. The tool was designed to reduce the risk. I even participated in its upgrade. But it's still not accurate enough to be used right away." (P2)

"If I had time to recheck the tool's algorithms, I would have been glad to do it. It might be interesting for inexperienced consultants to use it as an outcome homogenization tool. I still need to be sure that it delivers accurate eligibility screenings in accordance with the Frascati manual!" (P3)

> *"It's interesting to see that some of my colleagues are going faster with R&D project selection tasks thanks to the tool. It's up to them to do whatever they want, but I don't have time at the moment to verify a list of 40 questions before I even think of proposing the tool to my clients!" (P8)*

> *"I would not encourage nor discourage anyone from using the PMT! It's good for them if clients' financial status is perceived as safer because of the tool." (P1)*

Hence, the Inoculation sessions made participants with initially opposing attitudes more positive toward the advocated tool's benefits. Moreover, the Inoculation message was effective in protecting the individuals' attitudes following "attacks" by their peers from the "detractors" group. This was observed when the two experienced consultants from Montpellier argued that they were ready to *"give the tool a chance"* if their junior peers at the same office ever want to use it. More specifically, these two consultants stated the following:

> *"Like my colleagues in Paris, I don't have time to read any guideline or test any tool! But if the juniors want to use it, I have no problem at all." (P8)*

> *"I recently had a conversation with my colleague in Paris on the PMT subject. He thinks it's even riskier to use the tool than to provide the client with the non-homogenized result! I honestly don't know what to think. I think it merits to give the tool a chance." (P1)*

This finding is interesting because it shows gripping evidence that there is something unique about Inoculation interventions above and beyond individuals with established attitudes, that is, it succeeded to make opposing individuals more resistant to attacks from their peers. The double-sided characteristic of the refutational message employed in the Inoculation message may have been particularly critical. More precisely, the Inoculation intervention included messages based on arguments against the subject and then refuted them. Accordingly, the Inoculation message may have stimulated individuals with opposing attitudes to consider both sides of the subject, but also the potential weaknesses of their attitude position.

To conclude this section, the findings posit that Inoculation-based IT training sessions can be useful for both individuals with initially "positive" and "negative" attitudes, by using

Inoculation as a strategy to attract opposing ones to the desired direction. Indeed, these sessions were beneficial in adjusting negative attitudes in the desired attitudinal direction.

- **Individuals with Initially "Positive" Attitudes**

Research Question n°3: *"Could an Inoculation intervention during IT implementation reinforce 'positive' individuals' resistance to attitude change?"*

The findings are that the Inoculation-based IT training sessions were an effective strategy for protecting people with established attitudes from a counter-attitudinal attack, except for two individuals. However, six of the participants with "positive" attitudes who participated in the IT training sessions, experienced no post-attack attitude change after facing a persuasive attack due to IT conflict contagion.

As an answer to the first interview question (IQ1): *"Do you often get to use the PMT in your R&D PPM assignments?"*, P15 argued that he often used the tool and that he was currently using it in two different R&D project selection assignments. As for "weighting" the arguments provided by the respondents in support and opposition of the PMT, I show the results issued through the data collected from the interviews with each participant on the assessed subject regarding attitude valence. The statements are an excerpt from the participants' answers to IQ2: *"What are, in your opinion, the main disadvantages of using the PMT?"* and IQ3: *"What about the tool's advantages?"* Accordingly, P15 stated the following arguments "against" (attitude valence is negative) and "in favour" (attitude valence is positive) to the PMT:

> *(IQ2): "Well since the tool is based on a questionnaire that is filled by the client, the risk is when the client doesn't answer the questions seriously. But that isn't a weakness of the tool, it's just a risk coming from the client's side." (P15)*

> *(IQ3): "The tool makes me save a lot of time thanks to the online questionnaire. It's impossible to do 80 interviews with 80 different project managers at the client site. The tool does it for me!" (P15)*

Thus, P15 did not state any argument against the PMT. Instead, the participant evoked a risk associated with the project managers that might not answer the online questionnaire like

they should, or if in case it is not properly used by the client firm. Hence, attitude valence was deemed as positive in both statements. On the other hand, the data collected during the semi-structured interviews with the junior management consultants that initially had "positive" attitudes toward the PMT revealed a vulnerability of their established attitudes to potential change. For instance, when I asked P15 IQ4: *"Do you often hear your colleagues complaining about the PMT?"* and IQ5: *"Do you ever feel you will someday abandon the tool because of this?"*, he argued that he was afraid to *"do things wrong"* with the client, because he often heard conflicting opinions on the tool from different colleagues of his, and therefore, he was worried that this could lead him one day to cause major financial losses to a client of his. Accordingly, I noted the following statement:

> *"Every time I'm assigned on an R&D selection mission with the colleagues in Paris, I either have to use the PMT by myself, or I have to do like them and use their own way of doing. And that's because they complain the PMT is unusable and ugly." (P15)*

Moreover, the following:

> *"…but it's a pity to be the only one using the tool in the assignment and I'm afraid someday I do things wrong and things goes bad with the client if I stop using the PMT! You know, I could cause millions of euros of losses if I do things wrong!" (P15)*

Similarly, P16 also stated that he was currently using the PMT (IQ1). As for IQ2 and IQ3, the following statements are an excerpt from the participants' answers:

> *(IQ2): "Eventually speaking, the tool may be an obstacle for some consultants here to show off and an obstacle to taking the pride for issuing a pure mental eligibility screening. But that isn't my case, the tool is a positive force for me. I understand however the tool might provoke this to some colleagues working here." (P16)*

> *(IQ3): "The tool permits me to analyze a very large number of projects with very limited time and financial constraints!" (P16)*

> *"Thanks to the tool, there's practically no need for logistics! Everything is made online when client firms answer a series of questions issued by the tool. (P16)*

Thus, P16 did not state any argument against the PMT. Instead, he posited that the tool might induce some obstacles for some colleagues at EI, but not him. Therefore, attitude valence was deemed positive in all P16's statements. P16 also posited that the "ambience" and "culture" of EI had been indirectly encouraging employees to always complain about "anything in the firm", regardless of the subject's nature. Accordingly, P16 stated the following:

> *"It's really flexible to work at Efficient. But everyone complains because of this. Really. The PMT is just a minor example of these complaints. SX or even the fridge have their own complaining emitters, Ha-Ha. But to answer your question, I see that many of my colleagues here do their own way in R&D project selection missions because they refuse to use the PMT at the moment." (P16)*

As for IQ5, P16 stated the following:

> *"Well, hearing my colleagues nag about the PMT make me open my ears on the tool's point of weaknesses and improvement potential. I wouldn't stop using it. Contrarily, I would hear the others' complaints and propose ameliorations to the tool. Besides, I'm still very junior, and I'm afraid that I'm not capable of delivering accurate eligibility screening to the client without the tool." (P16)*

Thus, P16 argued that this atmosphere has been affecting him, and therefore he has been anxious that he would someday comply with his colleagues, causing him to stop using the PMT in her assignments. Moreover, the data collected from my observations and semi-structured interviews revealed that the employees appreciated the flexibility offered by the top management. Nevertheless, because of this "freedom of operation", many interviewees argued that it is difficult to implement a new process of any kind at EI because the consultants have the "freedom" to refuse it. For instance, P5 argued that using the PMT would induce a

structuring role into R&D project selection assignments and would, therefore, cause a *"loss of operational liberty".* Accordingly, my observations revealed that recently-hired consultants were rapidly influenced by this ambience which threatened their existing "positive" attitudes toward the PMT. That said, the three employees admitted the existence of a threat from their colleagues but did not show any sign of attitude change. First, P5 stated that she has been using the tool recently (IQ1). Moreover, in line with Inoculation theory, the threat was expressed by the participants and acted as a motivation for them to resist toward attitude change. For instance, P5's statements were similar to P16's in the sense that she defended (IQ4 and IQ5) her existing "positive" attitude toward the PMT stating the following:

> *"It's a pity that some consultants here do not agree with this. I'm not able to do the selection task for tens of projects without the tool and within the deadlines. I'd have to spend like 10 nights awake to do so! Which is something I am not capable to do!" (P5)*

As for IQ2 and Q3, P5 stated the following:

> *(IQ2): "The PMT requires specialised skills to be used. Guidelines should be read one by one, which is very time-consuming. I think it's the sole disadvantage for using the PMT for a newcomer like myself, especially when I had to spend a whole day to understand how it works, and 2 days to do the eligibility screening." (P5)*

> *(IQ3): "The PMT allows us to provide the client with one homogenised result which is very important to the client firm!" (P5)*

> *"The PMT is a tool that the client has never seen in his life. Based on the latest assignments I've been enrolled in, the client was truly attracted by the tool and showed more confidence in the eligibility results." (P5)*

Thus, P5 stated one argument against the PMT. However, her arguments in favour to the tool outnumbered the negative ones and therefore showed a rather positive attitude valence. On the other hand, in Montpellier, P18 posited that if he ever had to stop using the PMT, he would be afraid to do the R&D selection assignment all by himself, that is, he would not be

able to stick to the deadlines (IQ5). That said, P18 posited that, at the moment, he did not yet have to perform large-group R&D project selection assignments and therefore has been, until today, not asked to use the tool, as there was no point of using it in small-scale assignments (IQ1). Nevertheless, P18 stated the following:

> *"I'm eager to be assigned on a big R&D project selection mission! You know I had a training session on the new R&D project selection process that we developed internally. I think there's a major risk for us consultants, if we don't follow the respective procedures! So I would absolutely use the PMT to prevent anything that would put me, the client, or Efficient at risk." (P18)*

P18 stated the same counter-argument expressed by Mr Dupont during the Inoculation session regarding "risk prevention". Hence, if he does not use the PMT, the top management would see him as a "failure", and he would lose his "added value" in terms of weak performance and inefficiency, which is a factor of pride for him. On the other hand, like the participants above, P18 stated that he has been using the PMT lately (IQ1). As for IQ2 and IQ3, P18 argued the following:

> *(IQ2): "I think it's not logic to use the PMT in small R&D project selection assignments with less than 10 projects. The management cannot expect us to use it in that case. However, I would certainly use the questionnaire module of the tool to evaluate the eligibility in a face-to-face mode directly with the client." (P18)*

> *(IQ3): "The tool is a unique mean for making the client participate in the eligibility screening. You see, when a project manager at the client firm answers at least 40 questions generated by the tool online, he directly participates in the selection process! That is very valuable to him!" (P18)*

> *"The tool makes us spend a lot less time on screening a borderline project. Without the tool, a borderline project is the most complicated to assess because we have to ask like 40 questions orally in an attempt to understand whether the project is eligible to the CIR or not!" (P18)*

Thus, P18 did not state any argument against the PMT. Instead, he argued that the tool is not pertinent to be used in small R&D project selection assignments, which was in line with the management's objectives. Therefore, attitude valence was deemed positive in all P18's statements. However, P18 argued that he had never heard anyone in the office complaining about the PMT (IQ4), he was aware that some consultants in Paris were not "fans" of the tool, because he often heard some colleagues in Montpellier saying so. On the other hand, the data collected from the interviews with the newcomers in Montpellier revealed that all four individuals were "less aware" of the complaints toward the PMT, unlike their recently-hired peers in Paris, although the "master mind" of the tool, Mr Dupont, was actually based in Montpellier. This observation was made right after the "Post-treatment" phase during informal discussions used to feed my preliminary analysis of Cycle 3. Accordingly, this had been explained by the resistance from differences between the Paris and Montpellier office.

In other words, Mr Dupont argued during informal conversational discussions that the resistance behaviours in Paris were more "aggressive" than in Montpellier, as the individuals from the "detractors" group were engaged in an active form of resistance toward the PMT. In Montpellier, resistance toward the tool was more implicit, as those who have been rejecting the PMT only have been showing *"indifference behaviours"* according to Mr Dupont, which is considered as a passive form of resistance. However, the data collected from the interviews with the four recently-hired employees at Montpellier were "in phase" with this analysis, but they did not explicitly express any statement reflecting a threatening "state of being". Only three of them stated counter-arguments that defended their established positive attitude. For example, when I asked P19 IQ4: *"Do you often hear your colleagues complaining about the PMT?"*, he argued that he had never heard anyone in Montpellier complaining about the tool, but he knew that some consultants at the firm did not want to use it. Accordingly, P19 stated the following:

> *"No, I do not real hear my colleagues here complaining. But I know that some of my colleagues do not want to use it, or actually use it, because they have their own habits and way of doing." (P19)*

P19 argued that he has been using the PMT in an ongoing R&D project selection assignment (IQ1). As for IQ2 and IQ2, I recorded the following statements:

(IQ2): "I'm not yet an expert of the tool. I haven't use it too many times yet so I can't really judge its disadvantages, if there're any. But until now, everything looks good to me" (P19)

(IQ3): "The tool allows a special homogenization of multiple interpretations coming from the eligibility screening from different consultants working on the assignment." (P19)

"Thanks to the PMT, I am sure I won't produce different eligibility screenings than those of my colleagues. It puts me on the safe side vis-à-vis the top management but also the client!" (P19)

Thus, P19 did not state any argument against the PMT. Therefore, attitude valence was deemed positive in all his statements. As for IQ5, P19 argued that he has never thought about continuing or abandoning the tool. Respectively, he stated the following:

"Frankly, I never asked myself this question. As for the moment, I find absolutely no reason to stop using the tool. I mean I do not know how to do things otherwise." (P19)

Similarly, when I asked P20 how did he know that some employees at EI refuted the PMT (IQ4), he posited that he often heard his colleague, one of the developers of the tool, complaining that some consultants rejected the tool which put the client firm in high risk and respecting deadlines in jeopardy. When I asked P20 IQ5: *"Do you ever feel you will someday abandon the tool because of this?",* he stated the following:

"Oh no not at all. They do what they want. As for me, the tool is trustworthy as long as it's developed internally by consultants who know the utility and the assignments' nature very well. Besides, clients are actually hiring us because of the tool, so, there's no question I turn my back on it." (P20)

That said, P20 repeated the same argument that he stated during the post-treatment phase, indicating the following:

"I don't do large groups. I do only small firms, like 2 or 3 projects max. But still, I use the PMT because it looks sexy to the client. It also makes me look good!" (P20)

As for IQ1, P20 argued that he has been using the tool but for small R&D project selection assignments. As for IQ2 and IQ3, I recorded the following statements:

(IQ2): "I don't see any disadvantage at the moment. I would maybe say that the tool is rather adapted to large R&D project selection assignments and not small ones. But I have no problem with that, I use it anyway!" (P20)

(IQ3): "The PMT excites well the client, Ha-Ha. I mean, as soon as they see the shapes produced by the tool, they are like wow! It makes me feel proud of my firm and myself!" (P20)

"Besides, I think I'm the sole user of the tool for small R&D assignments. Which proves that it also works for this type of missions!" (P20)

Therefore, P20 did not state any argument against the PMT. Attitude valence was deemed positive in all his statements. P20 also argued that he was aware of some colleagues' resistance toward the PMT because he was often in touch with one of the developers. He also posited that other individuals' negative complaints at the firm were "constructive" but had "no effect" on him. Thus, the three employees, located in Montpellier, have not been direct "receivers" of a conflict contagion attack since the Inoculation session. Instead, the threat was implicit, as it was induced following hearing colleagues complaining about consultants that did not want to use the tool.

This observation contributes to the work of McGuire (1964), in the sense that, an attack message causing a feeling of threat, may be induced through an individual other than the attacker himself. The developers of the PMT were not "detractors" of the PMT; they were rather the "prime" advocates of the tool. They succeeded to transmit and induce a feeling of threat to the individuals that were surrounding them because they have been complaining about other consultants rejecting the PMT. Similar to a threat occurring from a "direct" attacker, the participants succeeded to form counter-arguments to defend their existing established attitudes. In other words, after the Inoculation intervention, the complaints made by IT-detractors on IT-

partisans served as a trigger of threat for recently-hired employees, which in turn, activated their "psychological defence" system causing them to state counter-arguments defending their current established attitudes.

Accordingly, these findings answer my third research question: *Could an Inoculation intervention during IT implementation reinforce "positive" individuals' resistance to attitude change?*

Nevertheless, the interview with P21 in Montpellier revealed an alternative observation. The data collected revealed an attitude change from "positive" to "negative". More specifically, when I asked him IQ4: *"Do you often hear your colleagues complaining about the PMT?",* P21 stated the following: *"Oh yes! I've spent the last month working in the Parisian office. The guys there are not at all fans of the tool!"* (P21). Then, to IQ5: *"Do you ever feel you will someday abandon the tool because of this?"*, P21 argued that he was no longer using the PMT, stating the following:

> *"I've already abandoned the tool. My colleagues in Paris showed me their way of doing and I think we don't really need the tool. I'm afraid it would slow me down." (P21)*

Similarly, the interview with P17 in Paris revealed the same observation, that is, his attitude shifted from positive to negative during the two-month delay between the Inoculation intervention and the interview. When I asked P17 IQ4, he argued that he had already done two R&D project selection assignments with his colleagues with whom he shared his office without using the PMT, because his peers did not want to use the tool. He added that he was therefore on the "safe side" because it was not his choice to refute the PMT, and that he complied with *"the majority that happened to make R&D project selection in other ways, without the tool".* Respectively, P17 stated the following:

> *"It's no longer my responsibility if something goes wrong with the client. I trust that my colleagues are experienced enough to choose wisely how things should be done." (P17)*

Accordingly, both P21 and P17's statements showed a clear attitude change, two months after the PMT training session. In other words, the data collected from the semi-structured interviews

showed a negative attitude valence to the contrary of the initial statements of the same individuals as shown in Table 46. As for IQ2 and IQ3, I noted the following statements:

> *(IQ2): "When I first used the PMT, I had to read the whole guidelines which are so so complicated! I've spent more than 2 days in order to understand how to send the online questionnaire and just that! It slows me down instead of saving time!" (P21)*
>
> *"Imagine if I send the questionnaire to the client and he fills it. Then I don't receive all his answers for some silly technical reason. What would I do? I just can't tell the client hey you should refill 40 questions because I didn't receive your answer! It would show we're amateurs." (P17)*
>
> *(IQ3): "The PMT is an attempt from the top management to re-structure the R&D project selection process. But, it might work for those who don't have deadlines to cope with, which isn't my case." (P21)*
>
> *"It's true that the tool might seem like appealing to the client because client firms wish to have such a magic tool! But now that I know how it works, I don't think it's appealing, I am the one who would be blamed if something goes technically wrong, not the PMT." (P17)*

Both P21 and P17 stated arguments against the PMT. Attitude valence was therefore deemed negative in all their statements. These findings answer my third research question and were consistent with prior studies (e.g., Banas and Rains, 2010), that is, Inoculation-based IT training sessions were deemed as effective for protecting individuals with "positive attitudes" from a counter-attitudinal attack and therefore from conflict contagion. Indeed, most of the interviewed newcomers that had established "positive" attitudes, and that assisted to the training sessions, as well as received an inoculation message before a persuasive conflict contagion attack, have not experienced any "post-attack" attitude change. However, two of the interviewed participants who received the Inoculation message witnessed post-attack attitude change and therefore decided to reject the tool.

To enquire about the reasons why their attitudes have changed, I conducted several observations and informal discussions with both P21 and P17. It was interesting to note that

P21 and P17 were close friends. Indeed, P21 and P17 knew each other before the joining Efficient Innovation Corporation and were classmates in graduate school. That said, P21 joined the southern France office in Montpellier, whereas P17 joined the Parisian office. However, the informal discussions with them revealed that they have "preserved" their friendship and maintained regular contact with each other. Additionally, my observations showed that P17 was a close friend with one of the "detractors" in the Parisian office as they often stayed together during lunch breaks and made mutual after-work and weekend plans. Then, the data collected during the interview with P17 revealed that the employee had changed attitude from "positive" during the Post-treatment phase, to "negative" during the Post-attack phase. Indeed, all his attitude components shifted from "positive" to "negative" (see Table 47, p. 199), having been "contaminated" by his colleague from the "detractors" group.

These observations are in line with the findings of Kimura et al. (2008), who argued that emotional contagion may be particularly salient in the case of friends, as individuals are highly tempted to be oriented toward their significant other's emotions. Accordingly, the ability to empathize with one's important human beings, makes him/her especially vulnerable to mimicking or adopting intimate their behaviours (Hatfield et al., 2009) or even confounding other individuals' emotions with one's own (Aron and McLaughlin-Volpe, 2001), especially those "close" human beings who are deemed high in "standing". On the other hand, although P17 and P21 worked in two different offices, they succeeded to exchange "negative" emotional flows (Ekman, 1982) even with absent explicit knowledge about the behaviours of each other. Hence, P17 succeeded to engage P21 in the IT conflict, which justifies P17's negative change of attitude components between the post-treatment and the post-attack phase (see Table 47, p. 199). Consequently, this observation helped me open the "black box" in Figure 21, and consider emotional contagion between individuals as a crucial factor that either boosts or decreases the impact of a conflict contagion attack on inoculated individuals with initially "positive" attitudes. Consequently, I present the modified conceptual framework of Inoculation to resistance to attitude change.

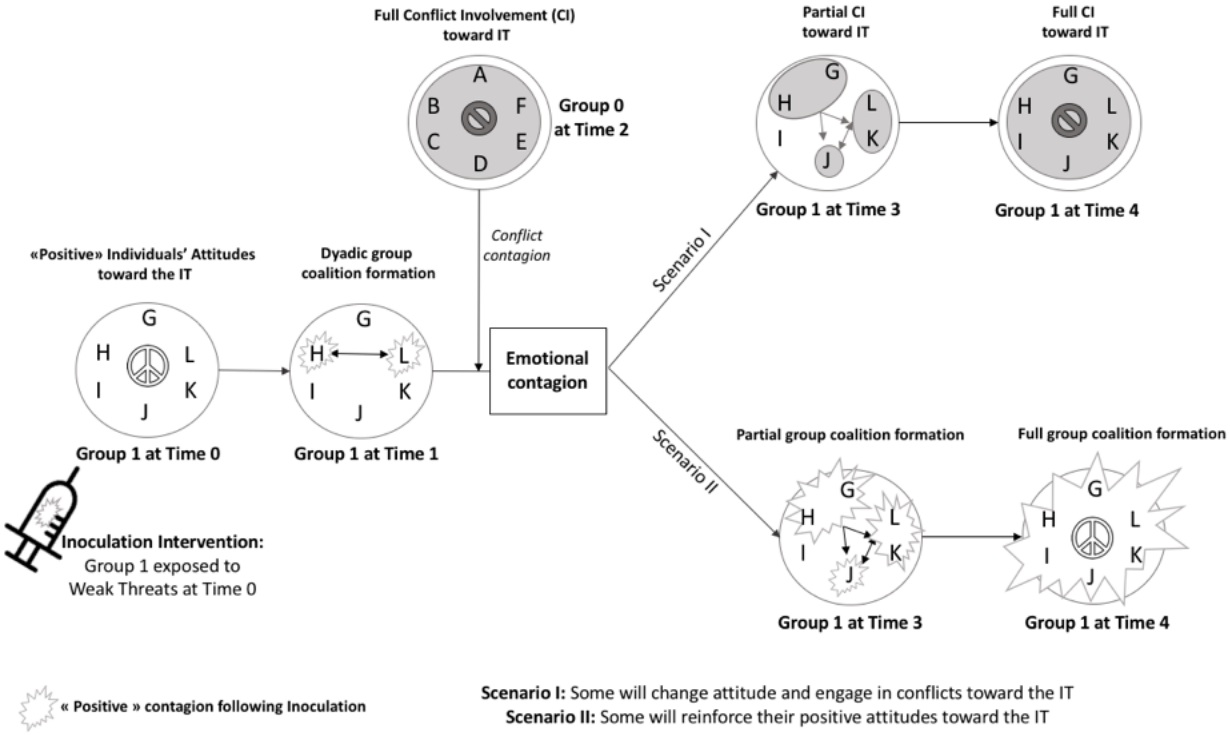


Figure 40: Modified Conceptual Framework of Inoculation to Resistance to Attitude Change

Indeed, emotional contagion occurring between individuals is an important factor that either boosts the impact of a conflict contagion attack or the impact of "positive" contagion, on inoculated individuals with initially "positive" attitudes. It boosts the impact of conflict contagion when the "attacked" individuals adapt their emotions to those of individuals with "negative" attitudes and with whom they are personally and socially close (e.g., friendship ties). It boosts "positive" contagion when the "attacked" individuals have no "special" or "privileged" relationships with other persons that have "negative" attitudes. On the other hand, although Inoculation does not lead to attitude change for individuals with existing "negative" attitudes, it slightly changes their attitudes in the direction of the Inoculation objectives (affective and cognitive attitude components). In that case, Inoculation simply functions as a two-sided persuasive strategy, rather than as a preemptive attitude protection resistance strategy.

The table below provides a summary of the main activities made collaboratively in Cycle 3 as well as the main findings and learnings obtained at the end of the cycle. These findings represented the end of my action research project at Efficient Innovation Corporation, as the project's objectives were considered as fulfilled during a meeting with the director-general. At the end of the year 2016, the director-general was satisfied with the results of the third cycle in general and the Inoculation intervention in particular. According to him, the AR

project succeeded in implementing a better version of the PMT, but also in shedding light on other organisational issues at EI (e.g., IT conflict contagion), which were beyond the initial objectives of the project. Accordingly, he decided to reform the internal Innovation Academy to include preventing other internal processes and projects from negative contagion mechanisms that might impact the organisation's well-being (e.g., internal knowledge transfer and management, customer relationship management, contract management, etc.). At this time, we considered the new reform project to be beyond my initial assignment, and we decided to end the action research project.

Action taking	• Selecting Inoculation theory as an approach for "fighting" IT conflict contagion mechanisms identified in Cycle 2; • Developing an IT-training methodology based on the principles of Inoculation theory which contrasts with "traditional" training sessions in that it involves encouraging participants to "think for themselves", rather than simply showing them how to perform an IT-related task; • Designing PMT-training sessions for recently-hired employees at EI, assuming that these individuals have "positive" attitudes toward the tool, that is, they have not yet been "contaminated" by other employees in the firm; • Developing a conceptual research model that illustrates the impact of an inoculation intervention on individuals with both "positive" and "negative" attitudes, following an "IT conflict contagion" attack; • Attitude valence was assessed right after exposure to Inoculation messages. The participants were grouped with respect to the initial attitudes toward the PMT (negative vs positive attitudes).
Evaluating	• Individuals with initially "negative" attitudes did not suffer "attitudinal harm" as a consequence of receiving an Inoculation message; • No positive attitude change was observed two months after the Inoculation session. Nevertheless, the "negative" attitudes of inoculated individuals shifted in the direction advocated in the Inoculation message; • Individuals with initially "positive" attitudes, experienced no post-attack attitude change after facing a persuasive attack due to IT conflict contagion, except for two persons; • One of these two persons was already "contaminated" by his colleague from the "detractors" group during his time spent in the Parisian office; • Further observations and discussions revealed that the two persons that "negatively" changed attitude were close-friends that succeeded to exchange "negative" emotional flows despite geographical distance; • Emotional contagion between these two persons played a negative role that led them to mutually reject the tool following an "IT conflict contagion" attack, during the dyadic group coalition formation phase.
Specifying learnings	• Emotional contagion occurring between individuals is a crucial factor that either boosts the impact of a conflict contagion attack, or the impact

	of "positive" contagion, on inoculated individuals with initially "positive" attitudes; • It boosts the impact of conflict contagion when the "attacked" individuals adapt their emotions to those of individuals with "negative" attitudes and with whom they are personally and socially close (e.g., friendship ties); • It boosts "positive" contagion when the "attacked" individuals have no "special" or "privileged" relationships with other persons that have "negative" attitudes; • Although Inoculation does not lead to attitude change for individuals with existing "negative" attitudes, it slightly changes their attitudes in the direction of Inoculation objectives; • In that case, Inoculation simply functions as a two-sided persuasive strategy, rather than as a preemptive attitude protection resistance strategy.

Table 48: A Synthesis of the Findings of Cycle 3

CHAPTER 4 - SUMMARY AND IMPLICATIONS

This chapter summarises the findings of the thesis and further discusses them shedding light on their implications to practice and research. Section 4.1 is a summary of the findings. Section 4.2 presents a detailed discussion of the theoretical and managerial contributions.

<table>
<tr><th>Introduction</th><th>Chapter 1 – Literature Review</th><th>Chapter 2 – Methodology & Research Design</th></tr>
<tr><td>. Research problem: Limited IS studies on contagion mechanisms between distinct IT projects.

. Research contract & field: CIFRE thesis at Efficient Innovation Corporation.</td><td>. User acceptance, resistance, conflicts, contagion, path dependence, and Inoculation.

. Theoretical discussion and development: Two conceptual models of IT conflict contagion, and Inoculation.</td><td>. Methodology used to apply the conceptual models developed in Chapter 1: Canonical Action Research.

. Research design used: Susman & Evered (1978)

. Empirical field: A French management consulting firm called Efficient Innovation Corporation.</td></tr>
<tr><th colspan="3">Chapter 3 – Findings & Discussion</th></tr>
<tr><td colspan="2">Findings
3 AR cycles:
Cycle 1: Socio-political conflicts & unexpected cause of resistance was blocking the new IT project.
Cycle 2: Ongoing conflicts toward another IT system were causing new IT project failure.
Cycle 3: Inoculation succeeded to « protect » positive attitudes and to « soften » negative ones.</td><td>Discussion
IT Conflict Contagion conceptual model explored cross-resistance influence effects between two distinct IT projects.
Inoculation-based IT training sessions were effective in protecting people with positive attitudes from a counter-altitudinal attack, and in adjusting negative attitudes in the desired attitudinal direction.</td></tr>
<tr><th colspan="3">Chapter 4 – Summary & Implications</th></tr>
<tr><td colspan="3">Cycle 1: Emotional-related conflicts could hide task-oriented ones; Non-IT employees could play the role of IT employees; Conflicts are rather dynamic; IT projects could include undeclared objectives; Users could simultaneously accept and resist to IT; Conflicts could be contagious; « Mentors » could act to heighten or stop the expansion of conflicts.
Cycle 2: « IT Conflict Contagion » could occur between two distinct IT systems; Knowledge could be converted into conflicts through socialisation; « IT Portfolio » view of resistance; « Resistance Path Dependency ».
Cycle 3: Resistance to IT could be « fought » with Inoculation; Threats and rumours may be considered as key triggers to defend « positive » attitudes; « Negative » attitudes could shift in the « positive » direction because of Inoculation; Emotional contagion could act against or in favour of Inoculation in case of « friendship » ties.</td></tr>
</table>

4.1 Summary of Results

The first cycle (February 2014 – April 2015, 14 months) at EI was to explore an existing decision support system, the Project Management Tool (PMT), to understand its technical characteristics, identify, then solve conflicts and resistance behaviours toward its first version. The purpose was to develop an upgraded (beta) version of the tool and make it available to use (deploy it) by all consultants working at the firm. Consequently, cycle one followed a research-dominant approach (Chiasson et al., 2009) by using literature on IS implementation success factors as a first source (Hsiao-Lan et al., 2005; Hong and Kim, 2002; Markus et al., 2000a, 2000b; Davenport, 1998). Other key sources for data collection included, but were not limited to, nine semi-structured interviews with key employees working at EI from both the "partisans" and "detractors" groups. Participant observations and several informal discussions with the same employees served as very important data collection sources. Conflicts were evaluated during several meetings with the members of both groups, and five categories of conflicts were unfolded (see Table 34, p.140). Although the members of the "detractors" group actively participated in the upgrade of the PMT, they kept on rejecting the project expressing task-oriented issues. These negative statements have gradually led other meeting participants to state other technical issues that blocked the imminent possibility of using the PMT and therefore engaging in the same active resistance behaviours as their peers. Surprisingly, beyond the PMT project, the data collected revealed an unexpected cause of resistance toward a different IT system at Efficient Innovation Corporation, that is, the firm's Enterprise Resource Planning (ERP) system, called "SX". It appeared that the ERP was successfully deployed in 2009, but had not been used as intended because of internal conflicts that have been accumulating over time. Therefore, it was necessary to end the first cycle of my AR and launch a second AR cycle in an attempt to understand the situation of conflicts toward the ERP, which was from outside the scope of my very research context, and which may have been affecting my AR project.

The second cycle (May 2015 – April 2016, 11 months) was a transitional phase, that is, it had the purpose of identifying past and ongoing conflicts toward the firm's ERP, and enquire about possible conflict contagion mechanisms between the two distinct IT projects at Efficient Innovation Corporation and between individuals in particular. Identifying such phenomena might reveal additional causes for PMT rejection. The second cycle followed a problem-solving approach (Chiasson et al., 2009) as it was more explorative, and focused on insights that can be induced from organisational problem-solving activities. Indeed, I have used the data

issued from my problem-solving activities to compare and contrast with existing IS theories (Chiasson et al., 2009), and develop new theoretical models and knowledge at the end of the cycle. Data sources included, but were not limited to, fourteen informal conversational interviews with both experienced and junior consultants at two different EI subsidiaries. The findings were that junior consultants joined the conflict along with their experienced peers because they were socially and professionally "attracted" to them. Because of "IT conflict contagion", they tended to support their experienced colleagues in their conflict toward the ERP. As a consequence, junior consultants joined their colleagues along conflict lines, and engaged conflict behaviours toward both the ERP and the PMT. At this moment, my findings answered the first and second research question raised in the theoretical part of my thesis (p. 83). At this time, it was not consistent to try to impose the deployment of the tool, before proposing a research-based management solution to the top management that aim to solve the identified IT conflict contagion problem. The firm's director-general argued that my challenge was rather to encourage newcomers to use the PMT, without using a "forcing strategy", as he was afraid it would contribute further to the "negative image" of IT at the firm. Finally, the DG gave me a limited time-frame to "operate", arguing that the AR project should be finished by the end of 2016, and the PMT should be implemented before then. Hence, we (the DG and I) agreed on ending Cycle 2 and starting a third and last cycle which lasted six months, and during which I should have identified a "change management" solution to be carefully used during the deployment of imminent the PMT.

The third cycle (April 2016 – October 2016, six months) was to identify a research-based change management approach to solve the IT conflict contagion organisational problem at Efficient Innovation Corporation that has been affecting the usage of the PMT. Then, the purpose was to apply this approach to training sessions on the PMT for recently-hired management consultants. Consequently, the main objective of Cycle 3 was to deploy the PMT in the firm at a large scale, while "protecting" recently-hired employees from being "contaminated" by their peers; thus, preventing them from resisting toward the implementation project because of IT conflict contagion. The third cycle therefore followed partially a research-dominant approach (Chiasson et al., 2009) by using, as a prime source, literature on how attitudes and beliefs change (McGuire and Papageorgis, 1961), and more essentially, how to make existing "positive" attitudes and beliefs resist (Fagnot and Stanton, 2015; Compton, 2013; Compton and Pfau, 2005) to external persuasion attempts (Lumsdaine and Janis, 1953). The third cycle also followed partially a problem-solving approach (Chiasson et al., 2009) by implementing the training sessions, which was explorative and consistent with thematic

analyses in which codes were constructed inductively (see Table 45, p. 197). Key data collection sources included, but were not limited to, fourteen semi-structured interviews with participants of the training sessions. My findings were that individuals with initially "negative" attitudes did not suffer "attitudinal harm" as a consequence of receiving an Inoculation message. Moreover, the "negative" attitudes of inoculated individuals shifted in the direction advocated in the Inoculation message. On the other hand, individuals with initially "positive" attitudes, experienced no post-attack attitude change after facing a persuasive attack due to IT conflict contagion, except for two individuals. At this moment, my findings answered the third research question raised in the theoretical part of my thesis (p. 86). One of these two persons was already "contaminated" by his colleague from the "detractors" group during his time spent in the Parisian office. Further observations and discussions revealed that the two persons that "negatively" changed attitude were close-friends that succeeded to exchange "negative" emotional flows despite geographical distance. The firm's director-general was satisfied with the results of the last cycle. Indeed, the AR project succeeded in fulfilling the objectives defined before the project's start. Indeed, the project succeeded in implementing a better version of the PMT, but also in shedding light on other organisational issues at EI (e.g., IT conflict contagion), which were beyond the initial objectives of the project. Hence, he decided to launch a new "reform project", through the Innovation Academy, in an attempt to preserve his firm from possible conflict contagion mechanisms that might have been affecting other organisational processes. Consequently, the new project was deemed to be beyond my initial assignment, and therefore we decided to end the action research project and start writing the doctoral dissertation in order to defend it before December 2017, according to the CIFRE contract.

Table 49 below shows a general synthesis of my action research project, based on Susman and Evered design (1978).

	Cycle 1 (02/14 – 04/15)	*Cycle 2 (05/15 – 04/16)*	*Cycle 3 (04/16 – 10/16)*
Diagnosing	*Objective:* • Understanding the technical objectives of the PMT (Portfolio Management Tool) as for the reasons for which it was developed in the first place; • Identifying and solving resistance behaviours toward the PMT; • Developing a beta version of the tool; • Go / No Go decision to deploy the IT tool.	*Objective:* • Enquiring about past and ongoing conflicts toward the existing ERP system; • Identifying negative impact relationships between the ERP project and PMT project, if they ever exist; • Enquiring about conflict contagion mechanisms between the two distinct IT tools; • Proposing a research-based solution for the new organisational issue.	*Objective:* • Identifying a theoretical-based change management approach to stop the IT conflict contagion process that has been affecting the PMT project; • Simultaneously deploy the PMT in the firm at a large scale, while "protecting" recently-hired employees from resisting the PMT implementation because of IT conflict contagion.
	Key sources: • Academic literature on IS user resistance and acceptance; • Alpha (first) version of the PMT; • Existing technical documentation on the tool; • Extensive informal discussions with employees working at EI; • One brainstorming session involving both key partisans (n=3) and detractors (n=4); • 1 Workshop session involving both key partisans (n=3) and detractors (n=4); • "Delivery" meetings involving the key partisans and detractors as well as junior consultants as intended users of the PMT; • Nine semi-structured interviews with key employees working at EI; • One meeting with the DG to discuss on how to proceed with the AR.	*Key sources:* • Academic literature on contagion and intragroup conflict contagion; • Existing documentation for the purpose of the new "Innovation Academy"; • Conducting a total of 14 informal conversational interviews with both experienced and junior consultants at two different EI subsidiaries.	*Key sources:* • Academic literature on resistance to attitude change; • Participant observations during two PMT training sessions with 12 and 15 participants; • 14 semi-structured interviews with participants of the training sessions.

	Data analysis: During several sessions with key employees at EI, direct observations, verbal and non-verbal communications were noted.		
Action planning	• Identifying both technical-oriented and socio-political oriented conflicts; • Brainstorming session reuniting both partisans and detractors of the IT tool to propose a technical upgrade plan.	• Reviewing the literature on intra-group conflicts and contagion and especially academic articles in which conflict contagion was discussed regarding conflict behaviours that arise between several individuals and groups; • A conceptual research model was developed for the top management; • Establishing "Validation groups" for data triangulation purposes.	• Selecting Inoculation theory as an approach to "fighting" IT conflict contagion mechanisms identified in Cycle 2; • Developing an IT-training methodology based on the principles of Inoculation theory which contrasts with "traditional" training sessions in that it involves encouraging participants to "think for themselves", rather than simply showing them how to perform an IT-related task;
Action taking	The purpose of Cycle 1 was to upgrade the tool then deploy the new version on a large scale at EI. Accordingly: • A "Workshop" session was organisssed with key employees associated with the DST project; • Then, I conducted nine semi-directive interviews with key employees initially invited to the brainstorming and Workshop sessions in an attempt to understand why the resistance behaviours continued to occur even after the tool's upgrade; • A "No Go decision" was collaboratively made with the firm's director-general concerning the implementation of a new version of DST.	• Developing an "IT conflict contagion matrix" to enquire about the evolution of intra-team resistance behaviours toward different projects in the firm's IT portfolio; • Developing a conceptual research model that illustrates a possible "IT conflict contagion" between two distinct IT projects; • Performing an analysis of an internal document on the objectives of the "Innovation Academy"; • Conducting a total of 14 informal conversational interviews with both experienced and junior consultants at two different EI subsidiaries; • Validating the interpretations through several "Validation group" sessions.	• Designing PMT-training sessions for recently-hired employees at EI, assuming that these individuals have "positive" attitudes toward the tool, that is, they have not yet been "contaminated" by other employees in the firm; • Developing a conceptual research model that illustrates the impact of an inoculation intervention on individuals with both "positive" and "negative" attitudes, following an "IT conflict contagion" attack; • Attitude valence (behavioural, affective and cognitive components) was assessed right after exposure to Inoculation messages. The participants were grouped concerning the initial attitudes toward the PMT (negative vs positive attitudes).

Evaluating	• Conflicts were evaluated during the PMT "Delivery" meeting: 5 categories of conflicts unfolded from the semi-structured interviews; • Although some key employees participated in the upgrade process, they have rejected the PMT stating task-oriented issues; • These statements have gradually led other meeting participants to state other technical problems that blocked the imminent possibility of using the PMT, and therefore engaging in the same active resistance behaviours as their peers; • The PMT project had a double role, one of which, was not revealed before the project's completion. The director-general used the action research project to "legitimise" the PMT as "scientific-based" in the eyes of the firm's clients; • Beyond the PMT project, the data collected revealed an unexpected cause of resistance toward a different IT system at Efficient Innovation Corporation, that is, the firm's Enterprise Resource Planning (ERP) system, called "SX".	• Junior consultants joined the conflict along with their experienced peers because they were socially and professionally "attracted" to them; • Because of "IT conflict contagion", junior employees tended to support their experienced colleagues in their conflict toward the ERP; • As a consequence, junior consultants joined their colleagues along conflict lines, and engaged conflict behaviours toward both the ERP and the PMT; • Experienced consultants exchanged active discussions on the conflict issue with their "private support networks" leading to extending the conflict situation to other experienced consultants that were not previously engaged in the initial conflict.	• Individuals with initially "negative" attitudes did not suffer "attitudinal harm" as a consequence of receiving an Inoculation message; • No positive attitude change was observed two months after the Inoculation session. Nevertheless, the "negative" attitudes of inoculated individuals shifted in the direction advocated in the Inoculation message; • Individuals with initially "positive" attitudes, experienced no post-attack attitude change after facing a persuasive attack due to IT conflict contagion, except for two persons; • One of these two persons was already "contaminated" by his colleague from the "detractors" group during his time spent in the Parisian office; • Further observations and discussions revealed that the two persons that "negatively" changed attitude were close-friends that succeeded to exchange "negative" emotional flows despite geographical distance; • Emotional contagion between these two persons played a negative role that led them to mutually reject the tool following an "IT conflict contagion" attack, during the dyadic group coalition formation phase.
Specifying learnings	• A task oriented conflict appeared to hide socio-political oriented conflict – the tool was used by the "partisans" groups to cover the lack of skills of junior consultants; • On the other hand, the "detractors" group badly perceived the PMT from an "ideological" point of view;	Emotional and behavioural contagion factors, as well as factors of threats to individual and team outcomes, were observed in Cycle 2, on two levels: **1.** between experienced consultants on one side; and	• Emotional contagion occurring between individuals is a crucial factor that either boosts the impact of a conflict contagion attack or the impact of "positive" contagion, on inoculated individuals with initially "positive" attitudes;

	• Indeed, the tool was a seen as a possible cause for autonomy loss, putting in jeopardy their practices and ways of doing, should they be imposed by the top management; • Surprisingly, new independent issues associated with the firm's ERP system came to light; • It appeared that the ERP has been successfully deployed in 2009, but has not been properly used because of internal conflicts that have been accumulating over time; • It was not consistent at this stage to force a PMT consensus of a conflict-resolution strategy; • It was necessary to end the first cycle of my AR and launch a second AR cycle in an attempt to understand the situation of conflicts toward another IT project, from outside the scope of my very research context, that may have been affecting my AR project.	**2.** between junior consultants and experienced consultants on the other side. • In addition to coalition formation, the negative emotions toward the ERP also tempted initially uninvolved team members to be enrolled in the conflict; • "IT Resistance Path Dependency" occurred, which is a process in which EI faced the same state of "illness" of IT resistance behaviours, due to prior conflicts on the firm's ERP, all along its path.	• It boosts the impact of conflict contagion when the "attacked" individuals adapt their emotions to those of individuals with "negative" attitudes and with whom they are personally and socially close (e.g., friendship ties); • It boosts "positive" contagion when the "attacked" individuals have no "special" or "privileged" relationships with other persons that have "negative" attitudes; • Although Inoculation does not lead to attitude change for individuals with existing "negative" attitudes, it slightly changes their attitudes in the direction of Inoculation objectives; • In that case, Inoculation simply functions as a two-sided persuasive strategy, rather than as a preemptive attitude protection resistance strategy.

Table 49: A Summary of the Research Design and Results of the Action Research Project

4.2 Theoretical and Managerial Implications

4.2.1 Cycle 1

The results of Cycle 1 allowed me to identify two main conflict categories: 1. Socio-political oriented conflicts: conflicts due to a loss of power and autonomy; and 2. Task-oriented conflicts: conflicts about the system, the definition of the execution of tasks that users must fulfil, and conflicts about the new professional skills required. Further observations on the conflicts' evolution have led to inform theories related to research on IT users' resistance.

First, the first identified conflicts were task-oriented in the sense that the interviewed individuals expressed only negative thoughts about the tool's technical difficulties. Then, it occurred that these conflicts were hiding great socio-political conflicts related to the loss of power and autonomy induced by the tool and perceived by the intended users. Accordingly, this observation is in line previous studies done on power conflicts associated with IT implementation (Meissonier and Houzé, 2010; Leidner and Kayworth, 2006; Kohli and Kettinger, 2004; Jasperson et al., 2002; Hart and Saunders, 1997; Markus, 1983). The observation is also consistent with Ford et al. (2008) who argued that emotional conflicts can over top task and technical-oriented conflicts in firms. Indeed, the semi-structured interviews made in Cycle 1, were based on the list of risk factors that may cause IT implementation failure (Meissonier and Houzé, 2010; Markus et al., 2000a; Rowe, 1999), which was used as an interview grid (see Table 32, p. 131). The data collected during these interviews revealed that references to emotional-related conflicts outnumbered those to task-oriented conflicts, which was a first step to identifying the real organisational problem. The results also point up that "IT employees" (in my case, the team of management consultants that developed the PMT), tempt to disregard organisational issues in IT systems. In line with the observations of Hornby et al. (1992, p. 165), "IT employees" are mainly rewarded for delivering technically sound systems on time and on budget. Nevertheless, it is worth noting that the developers of the PMT were management consultants on a full-time basis, with a limited knowledge of IT design and implementation. That said, they succeeded to "transform" themselves as IT designers, to focus only on the development and technical project management side of the IT project, in contrast with their management consulting practice that focuses on tackling human and organisational problems before proposing any solution. Hence, this observation complements Hornby et al.'s (1992, p. 165) finding, that is, "IT employees" may also consist of "non-IT employees", that played the role of "IT employees", in the project being studied.

On the other hand, my observations revealed that resistance behaviours toward the PMT evolved between the group of "detractors" (experienced consultants that rejected the PMT), to become active resistance behaviours (during the upgrade of the PMT), then to become aggressive resistance behaviours as they felt they were being forced to use the PMT. Hence, acts of resistance moved from a passive form (observed during Cycle 1) to an active form (observed during Cycles 1, 2 and 3), then to an aggressive form (observed during Cycle 1 and 2). In line with the findings of Meissonier and Houzé (2010), this evolution of resistance forms showed that conflicts are not fixed and depend on the way the stimulants are perceived over time.

On the other hand, a year after I started my investigation at EI, the data collected during the meeting with the director-general at the end of Cycle 1, revealed that the PMT upgrade project played a double role. One of which, was not revealed before the project's completion. The director-general used the action research project to "legitimise" the PMT as "scientific-based" in the eyes of the firm's clients. For instance, at the beginning of the project, I was required to enquire about the organisational issue as well as on the best research-guided methodology to solve the issue, only within the scope and objectives of the very project, and within the technical specifications of the tool that were defined before the project's start. This result is consistent with the phenomenon of hidden, tacit or covert goals put forward by Frame (1995, p. 49), Kotsalo-Mustonen (1996, p. 49–50), Saravirta (2001, p. 54–55), and Turner (1993, p. 55–56). Hence, a possible cause of IT project failure is that the result of the project while being in line with the initially expressed objectives, did not meet the hidden objectives of the initiator of the project – the director-general (Cicmil and Hodgson, 2006; Packendorff, 1995). Therefore, this finding invites IS designers and practitioners to consider the top management's underlying objectives as significant for overall project success. That said, this finding could have explained why the PMT implementation failed. More precisely, I could have assumed that the PMT project failed because the DG "justified" the negative behaviours of the detractor group members, and argued that the PMT was not useful for them. However, the DG claimed that he had always encouraged the employees to use the PMT and never showed indifference or avoidance behaviours in front of them. Hence, this led me to consider that this observation as sufficient to envisage an alternative approach: to examine the phenomenon from outside the project's social and technical perimeter as possibly negatively impacting the project.

Second, my observations made during the "Delivery" meeting in Cycle 1 were consistent with Van Offenbeek et al. (2013) who argued that individuals can simultaneously

accept and resist to IT. Indeed, although the individuals from the "detractors" group participated in the technical upgrade of the PMT, and although they argued that they were satisfied with the new version of the tool, they still blocked the second attempt of implementation putting forward task-oriented issues. Moreover, the "detractors'" statements gradually led other meeting participants to state other technical issues that blocked the imminent possibility of deploying the PMT, and therefore engaging the other attending individuals in the same active resistance behaviours as their peers. This observation is consistent with the assumption of Jehn et al., (2013), Li and Hambrick (2005), Jehn and Chatman (2000), Jehn et al. (2010, 2006), Jehn and Rispens (2007) and Pruitt (1995), that is, when increasing numbers of members of a team behave in a conflictual manner, an increasing number of members are also likely to agree and potentially engage in conflict behaviours themselves. Hence, while understanding how individuals or groups may develop conflict behaviours and resistance to change (Lapointe and Beaudry, 2014; Van Offenbeek et al., 2013; Meissonier and Houzé, 2010) my observations revealed that one must take into account contagion mechanisms that occur between individuals. Moreover, these studies have been conducted mainly on task-oriented and socio-political conflicts, whereas my observations extend the results to "contagious" conflicts that are considered as being more complex situations in which conflicts evolve with time (Jehn et al., 2013).

This observation is also similar to the concept of behavioural mimicry between individuals (Chartrand and Lakin, 2012), which is a form of interpersonal coordination between individuals that are mimicking or being mimicked by other persons that are perceived as "legitimate sources" or "safe". That said, the data collected through the semi-structured interviews (in Cycle 1) and informal conversational interviews (in Cycle 2) revealed an unknown cause of conflict. Several references were made to another IT system in the firm. The data collected revealed that the company had an ongoing "problematic" situation toward its ERP, which had been somehow influencing the distinct PMT in general and the behaviour of junior consultants toward the PMT project in particular. Indeed, the analysis of the internal document produced by the firm's psychologist revealed that junior consultants joined the initial conflict of their experienced peers because they were socially and professionally "attracted" by them. Moreover, experienced consultants exchanged active discussions on the conflict issue with their "private support networks" (Kolb and Bartunek, 1992) leading to extending the conflict situation to other experienced consultants that were not previously engaged in the initial conflict. Some similarities can be made here with the exchange of tacit knowledge that cannot be formalised or easily extracted into manuals (Nonaka and Takeuchi, 1996). In my

case, tacit knowledge consisted, among others, of negative opinions on the firm's IT systems. Accordingly, individuals obtain this tacit knowledge through shared experience and discussions with "mentors" who possess such knowledge (Nonaka and Takeuchi, 1996). The "mentors" consisted of the main experienced consultants who were already engaged in conflicts. Private support networks consisted of several experienced consultants at each subsidiary of EI, that had "friendship" ties with each other. Hence, this observation shed light on the role of internal "private support networks" and "mentors" in heightening the evolution and expansion of conflicts in firms undergoing IT implementation projects. This finding is therefore significant, as IS designers and practitioners may work on identifying these internal networks and mentors, to benefit from the strong ties linking individuals with each other to reverse their utility. For instance, in line with Kimura et al.'s (2008) findings, emotional contagion may be particularly salient in the case of socially-close individuals (e.g., friends), as they are highly tempted to be oriented toward their significant other's emotions. Then, IS managers may use these networks as a starting point and attempt to engage, convince or apply any IS-related change management method on the key members of private support networks, as they might turn out to be the major "cascading influencers" in favour of the IT project. For instance, IS managers may consider mentors as catalysts in the learning process because they contribute to promoting "social order" (Lane, 2016). By involving "mentors" in the change process, they would shift from being "conflict transmitters" to protectors, shielding the mentees from inappropriate criticism and protecting them from hostile individuals in the organisation (Buckley, 2016).

4.2.2 Cycle 2

The observations made during Cycle 2 revealed that conflict behaviours do not immediately occur as conflicts in which all members are fully, equally involved. This finding is consistent with Jehn et al.'s (2013) assumption that such behaviours can be the consequence of a conflict that has occurred within a group of employees at some point in the firm's history, and that has come also to infect, or involve, other team members over the course of time (Jehn et al., 2013). For instance, the statements of the chief financial officer made me realise an entirely new and urgent organisational problem associated with information technology. When I started my investigation at EI on the firm's PMT, I was not aware that an entirely different IT system was also witnessing resistance behaviours involving serious organisational issues. Consequently, despite the new version of the PMT had not been implemented, the subject of my research evolved. My observations encouraged me to consider that task-oriented and socio-

political oriented resistance behaviours toward an IT project are not always sufficient to diagnose and to solve the organisational problem being studied. Therefore, instead of focusing on conflicts toward one IT project, one should take into account similar negative behaviours toward other IT projects at the firm as they might altogether affect the organisation as a whole. Rather than focusing on "IT project" resistance, IS practitioners should investigate "IT portfolio" resistance and get the whole picture of conflict behaviours toward several IT projects at the studied firm.

For instance, through emotional and behavioural contagion mechanisms (Jehn et al., 2013), the conflict involvement of junior consultants was not only toward the initial subject of conflict (the ERP) but to the very "state" of being in conflict (resisting to technology in general). In other words, IT conflict contagion had succeeded to compel employees to support their peers in their conflict toward the ERP and thereby to join them along conflict lines and to express conflict behaviours toward both the ERP and the PMT. Nevertheless, by resisting toward the PMT, the junior consultants had an additional opportunity to comply with their colleagues through emotional and behavioural contagion (Greer and Jehn, 2007a; Yang and Mossholder, 2004; Lee and Allen, 2002; Barsade, 2002; Bodtker and Jameson, 2001; Kelly and Barsade, 2001; Barsade and Gibson, 1998; Hatfield et al., 1994). Thereby, my findings contribute to Martinko et al.'s (1996) IT attributional model, that is, the interviewed individuals engaged passive resistance behaviours toward an IT tool with different characteristics and objectives than the ERP. In other words, resistance contagion seemed to be an opened phenomenon where projects' characteristics are not the keystone. Therefore, beyond the way IT projects are designed, developed and presented regarding objectives, my findings reveal that IT projects can endorse value conflicts between ideological principles of users or groups of users and the perceived underlying strategic objectives assigned to IT deployments (Leidner et al., 2006). In other words, my findings posit that IT resistance turns out to be in the light of the portfolio of past and present projects. Moreover, in addition to prior negative experiences associated with IT implementation (e.g. ERP, CRM, KMS), I invite IS researchers to take into account the cross-resistance influence of behaviours between totally distinct projects in the firm (i.e. different technical specifications, stated objectives, intended users, and different project stakeholders, etc.)

While many frameworks of conflict behaviours exist, they comprise actions as engaging in process control, forcing, confronting, accommodating, compromising, problem-solving, and avoiding (Meissonier and Houzé, 2010). On the other hand, Benbasat and Barki (2007, p. 216) stated in a special issue of the Journal of the Association for Information Systems

that research on technology acceptance has reached a point where *"TAM has fulfilled its original purpose and that it is time for researchers to move outside its limited confines".* Contrary to TAM-based prior research studies, many articles in social psychology (Abrams, et al., 1990, Deutsch and Gerard, 1955, Festinger, 1954) and consumer behaviour (Oliver and Bearden, 1985; Shimp and Kavas, 1984) consistently indicate that the influence of other individuals plays a substantial role in explaining human behavioural. Furthermore, normative social influence is an additional factor that was later added to numerous technology acceptance models, based on Fishbein and Ajzen's (1975) assumption, that social influences make individuals conform to the positive expectations of other individuals. The unexpected identified conflict situation was consistent with prior studies that showed that previous failing projects of IS integration were observed as contributing to a bad image of ERP projects (Nelson, 2007; Markus et al., 2000; Davenport, 1998). These studies have mainly observed resistance behaviours between successive and similar IT projects in terms of functionalities. However, in my case, the two IT systems were far in terms of objectives, users, design and functionalities. Indeed, the ERP was a "ready-to-use" enterprise system for internal administrative purposes, whereas the PMT was an Excel-based application that aims to help consultants with R&D PPM assignments. Moreover, the ERP project started in 2009, five years before the PMT project. It had a different budget allocation, duration, and project team. When the ERP project started, an external technical support team intervened at EI to implement it and perform training to key consultants, that was in turn supposed to train the remaining consultants at EI.

Hence, a contribution of my thesis, is to propose a conceptual framework of "IT conflict contagion" (see Figure 20, p. 82) between two different IT systems. My conceptual model illustrated the cross-resistance effects between two projects only, instead of multiple projects. This was due to my observations of my empirical research field (Efficient Innovation Corporation). Indeed, the firm had only two dominant IT projects (the ERP and the PMT). That said, I could have enquired about IT conflict contagion on the portfolio level, should EI had other IT projects. Indeed, "IT conflict contagion" evolved in groups. For instance, through the mechanisms of emotional and behavioural contagion, as well as factors of threats to individual and team outcomes, the observations and informal conversational interviews in Cycle 2 revealed a conflict contagion and "coalition formation" between experienced consultants on one side, and between junior consultants and experienced consultants on the other side.

Very little is known about the role of IT conflict contagion, from conflicts that occurred in the past, or currently occurring toward another IT system in the firm, on the behaviour of participating users during the deployment of new IT. Nevertheless, "social influence", a

relatively similar concept to contagion, proved to be a critical factor on adoption behaviours of future users in general (Greenhalgh et al., 2009; Venkatesh et al., 2003). For instance, social factors have been considered as determinants of human behaviour, because many individuals tend to conform to the majority's opinion or have it as a base for their decisions (Asch, 1995). In both resistance and acceptance literatures, influencing factors on adoption behaviours and ways to manage adoption behaviours are investigated (Seo et al., 2011; Venkatesh et al., 2003; Markus, 1983). Other studies also argue the firm's social environment as a critical element in the emergence of adoption behaviours of individuals (Kelman, 2006; Venkatesh et al., 2003; Markus, 1983). Furthermore, several antecedents of social influence like colleagues' opinions seem to play a substantive role in the adoption behaviours of employees in an IT implementation project (Wang, Meister and Gray, 2013; Kim and Kankanhalli, 2009; Venkatesh et al., 2003). Nevertheless, all these studies focused on social influence mechanisms occurring in the context of the IT project being handled, and only this. Also, some of these studies concentrate on the impact of negative experiences with the same type of IT (e.g., prior ERP implementation failure experience) that occurred in the past on the new IT project (e.g., new ERP implementation experience). In contrast with these studies, my findings contribute to both the IT acceptance and IT resistance literature, because I present a new conflict contagion framework, in which, past and ongoing conflicts toward an existing IT system, come to influence the behaviours of employees working on a new IT tool with different objectives, project teams, functionalities, and specifications.

Then, I developed, explored and submitted the "IT conflict contagion matrix" (see Table 36, p. 159 and Table 39, p. 170) to critical scrutiny upon key employees at EI. By using a checklist of elements, as of the factors that might trigger conflict contagion, I assumed that the more I had "Yes" answers to the questions raised in the matrix, the more the firm would be likely witnessing high-energy conflict contagion (Jehn et al., 2013; Barsade, 2002), lock-in mechanisms (Kucukyazici, 2014), and conflict self-reinforcing mechanisms (Mahoney, 2000).

Indeed, by resisting toward the PMT, the junior consultants had an additional opportunity to comply with their physically-close colleagues. Moreover, the data collected from the unstructured interviews (in Cycle 2) revealed that employees from the same team align their behaviours to comply with socially similar individuals. This observation is consistent with Jehn et al.'s (2013) and Crano and Cooper's (1973) assumption that team members jointly act to form ideological coalitions. Consequently, following coalition formation, conflict situations are extended to include other members of the team. Nevertheless, in contrast with Smith's (1989) finding that members involved in the initial conflict proactively

recruit other members to form coalitions, my observations reveal an alternative finding. Experienced consultants were observed expressing negative emotions each time they have received a reminder from the HR manager to fill up the ERP. However, their resistance behaviour was passive, that is, they did not intensively act to affect the behaviours of their junior peers. Instead, because of coalition formation mechanisms, junior consultants joined the initial conflict of their experienced peers because they were socially and professionally "attracted" to them. That said, my observations confirm Jehn et al.'s (2013) assumption that the spread of conflict in teams is likely to be facilitated by coalition formation when conflicts occur, and that coalition formation may cause conflict contagion, and friendship ties between team members may act to engage "positive" members in the initial conflict. This observation is also consistent with the findings of Bodtker and Jameson (2001), Greer and Jehn (2007a), Yang and Mossholder (2004), Lee and Allen (2002), and Barsade (2002), on behavioural contagion, that is, behaviours are spread through individuals by simple exposure. The observations are also consistent with the concept of informational mimetism (Deutsh and Gerard, 1955), where an individual imitates others because they are supposed to be better informed. The first individual would evaluate his/her beliefs by comparing them with those of their reference group (Festinger, 1950) and later conform to the beliefs of the group (Hochbaum, 1954). Some similarities can also be made with the tacit-to-tacit (socialisation) mode of knowledge conversion of Nonaka and Ikujiro (1990). Indeed, according to the SECI (Socialization, Externalization, Combination, and Internalization) model of knowledge creation, tacit knowledge is converted into organisational knowledge through the phenomenon of socialisation, between others, as tacit knowledge can be acquired only through shared and hands-on experience. Accordingly, recently-hired junior consultants, called "apprentices", learn about the existence of conflicts from their experienced peers. Hence, new knowledge is created on the conflicts toward IT by using the process of interactions, observing, discussing, analysing, spending time together or living in the same environment.

In my thesis, I defined "resistance path dependency" as a process in which a firm faces similar resistance behaviours all along its path due to conflict contagion mechanisms occurring between individuals. More specifically, I assumed that resistance behaviours toward a past or present IT system (IT0) should be considered as one "infectious" disease that spreads and engages in the conflicts other individuals implementing a new IT system (IT1) with different objectives and characteristics. Consequently, IT1 would witness negative and resistance behaviours leading to implementation failure, or system non-use after implementation, because of conflict contagion mechanisms. Then, "lock-in mechanisms" occurred in the employees'

behaviours. For instance, Barnes et al. (2004) call these mechanisms behavioural lock-in, where an individual's behaviour becomes locked-in because of habits, learning or culture inhibiting the firm in which s/he works. Moreover, behavioural lock-in is defined in the psychology literature as a situation of behavioural irreversibility due to learning and habitation (Davis, 2015). Nevertheless, the findings of the second cycle revealed a similar, yet a new lock-in phenomenon, which I call "IT Resistance Behavioural Lock-in". More specifically, this phenomenon occurred when the resistance behaviours of an individual toward IT were "stuck" due to his/her prior exposure to resistance behaviours that happened in the past toward an IT system, which continuously made the individual resist toward any new IT. Moreover, "IT Resistance Behavioural Lock-ins" were highly "contagious", as individuals captured the conflict behaviour of others through emotional and behavioural contagion and coalition formation.

Along with the theoretical value of the study, understanding the way ongoing conflicts toward another IT system in the firm's "IT portfolio" may initiate mechanisms of IT conflict contagion, practitioners are, at the same time, likely to instil positive contagion mechanisms. Conflict contagion mechanisms are difficult to manage by IS practitioners, as conflicts evolve in a very complex and lengthy manner. By managing change in independent IT projects separately, with different teams and even with different methods, organisations may unconsciously lose sight on the way users' attitudes may be interrelated through conflict contagion mechanisms, involving cross-resistance effects. However, the "encouraging" factors through which "IT conflict contagion evolve", may be managed more easily.

4.2.3 Cycle 3

A first way may be to consider contagion in social science in the same way than in medicine and consider rumours, over-interpretations of officious objectives of separated projects, as a sort of social disease appealing a managerial intervention. The literature in psychology in general, and Inoculation Theory in particular posit that human behaviours could be inoculated against influential negative attacks (McGuire, 1964). Shang and Su (2004) argue that successful implementation depends on successful change strategies that can overcome resistance behaviours and induce readiness. Other IS acceptance streams include change techniques on how preventing or reducing user resistance (Self and Schraeder, 2009; Self, 2007; Judson, 1991) and how supporting readiness for change (Self and Schraeder, 2009; Self, 2007; Armendakis, 1993). Most of this research work consisted of strategies that create readiness or reduce resistance as a dependent variable. On the other hand, Inoculation theory

boasts an impressive body of empirical research testifying to its efficacy in conferring resistance to influence in different research contexts (e.g., marketing, health, politics), but very little in the IS field (Fagnot and Stanton, 2015). Accordingly, the main contribution of Cycle 3 was to apply a conceptual research framework of Inoculation to resistance to attitude change (see Figure 21, p. 85). The framework presents the impact of an inoculation intervention on "positive" individuals, after exposure to conflict contagion, regarding Inoculation subjects' resistance to attitude change. In line with Fagnot and Stanton's (2015) research on Inoculation, the syringe is a metaphor for a vaccine containing weakened viruses (threats). Then, individuals belonging to Group 1 at Time 0 would receive the vaccine (inoculation intervention). At Time 1, a few individuals commence to interact with the vaccine but engage in "positive" contagion. At Time 2, Group 0 would tend to "infect" the inoculated individuals. Group 0 consists of individuals having full conflict involvement toward an IT system in the firm. Then, two opposing scenarios might occur: 1) some will change attitude and engage in conflicts toward the IT, or 2) some will reinforce their positive attitudes toward the IT, and thus their commitment to using the IT system. The second scenario shows how group coalition evolves through "positive" contagion.

Strategies for managing user resistance in the IS literature have been divided by Jiang et al. (2000) into two types: participative and directive. Participative techniques mainly require involving employees in the development of the new IT system to encourage a feeling of ownership. In my case, involving experienced consultants from the "detractors" group in the development of the upgraded version of the tool (Cycle 1) was a failure. Indeed, following the successful development of the second version of the PMT, the employees from the "detractors" group maintained their negative behaviours (conflicts) toward the tool, blocking the imminent deployment attempt. On the other hand, directive techniques consisted, among others, to establish document standards, so new procedures are easy to learn. It also requires rewarding ideas that improve throughput or using managerial authority to effect change (Jiang et al., 2000). This technique was also tested in Cycle 1, and induced negative consequences. The documentation and guidelines on the PMT were successfully produced by the developers of the tool (members from the "partisans" group) but were completely refuted by the employees from the "detractors" group. Moreover, during the brainstorming session that gathered both members of the "partisans" and "detractors" group, ideas emerged from both camps, were noted, taken-into-account, and rewarded by selecting them in the tool's improvement plan. However, despite this, the members of the "detractors" group maintained their resistance behaviours toward the PMT. Last but not least, using managerial authority to effect change was

deemed, in my case, as a very negative method to induce change. Many of the interviewed employees (both in Cycle 1 and Cycle 2) argued that they would completely boycott R&D PPM assignments, should the top management impose to them to use the PMT.

Therefore, in contrast to these techniques, and contrary to Lewin's (1951) force field theory of change, and Kreitner's (2004) argument that managers must be able to minimise and neutralise employees' resistance to successfully implement change, my observations reveal an alternative finding. Inoculation was conveniently used in its traditional sense, as a strategy of resistance to resistance, or "fighting fire with fire".

First, it consisted into enhancing resistance behaviours to identify latent conflicts directly or indirectly related to the project. Second, using a weakened form of the identified resistance (dead virus - by injecting it into their psychological body), individuals with "positive" attitudes were threatened that their behaviours were susceptible to be attacked by their colleagues, As a consequence, their psychological immunity system, just like in medical vaccination, was boosted and succeeded to resist to IT resistance coming from their "negative" colleagues. Hence, the "positive" attitude of these employees were maintained and reinforced. Only one study, to my knowledge, examined the use of Inoculation theory in the IS field (Fagnot and Stanton, 2015). However, Fagnot and Stanton's study was not about IT implementation. Their study used Inoculation Theory to hypothesise that students who heard an inoculation message before a persuasive message concerning IT post-graduate employment showed resistance to attitude change. Therefore, my findings contribute to the IT implementation theories that put forward change management techniques.

Indeed, Inoculation theory has very limited usages in the field of information technology implementation projects. Therefore, it was interesting to see how applying it in the IS field may bring original contributions into the existing body of research on change management techniques in IT-related projects. Accordingly, the main contribution of Cycle 3, was to develop an IT-training methodology (see Table 41, p. 191) based on the principles of Inoculation theory which contrasted with "traditional" IT training sessions in that it involves encouraging participants to "think for themselves", rather than simply showing them how to perform an IT-related task.

Moreover, contrary to the concept of downward social comparison of Wills (1981), who argued that individuals who are "threatened" by failure on a specific dimension tend to socially compare with other individuals who are thought to be worse off on this very dimension (Buunk and Gibbons, 2007), my findings reveal an alternative observation. Following the exposure to Inoculation messages, threats were fuelling the immune system of the inoculated

individuals, which made them resistant to the conflict contagion attacks. Indeed, threats were crucial factors that made individuals maintain their "positive" attitudes by socially comparing themselves with those who are better on this very dimension. My findings revealed that Inoculation-based IT training sessions were useful for both individuals with initially "positive" and "negative" attitudes, by using Inoculation as a strategy to maintain and reinforce "positive" attitudes while attracting "negative" ones to the desired direction.

In my case, the sessions were beneficial not only in preserving persons with initially positive desired attitudes but also in adjusting negative attitudes in the desired attitudinal direction while protecting them from attack-induced consequences. In line with Wood's (2007) findings, the four invited participants that had opposing attitudes did not suffer "attitudinal harm" as a consequence of receiving an Inoculation message. Although the four individuals stated that they have not been using the PMT for the same task-oriented reasons expressed in Cycle 1, they argued during informal discussions that the tool had some advantages, which reflected a change in one or more attitude components in the post-attack phase. Accordingly, the Inoculation message have succeeded to stimulate individuals with "negative" attitudes to consider both sides of the subject, but also the potential weaknesses of their attitude position. Moreover, the participants' counter-arguments were assessed via a "Thought-Listing Technique" (Petty et al., 1976) successfully applied in prior quantitative Inoculation research work (e.g., Pfau et al., 2009). To my knowledge, my study is the first to use this technique with a qualitative analysis. As for "weighting" the arguments provided by the respondents in support and opposition of the PMT, my findings were that the Inoculation-based IT training sessions were an effective strategy for protecting individuals with established attitudes from a counter-attitudinal attack, except for two individuals. However, six of the participants with "positive" attitudes who participated in the IT training sessions, and who therefore received an Inoculation message, experienced no post-attack attitude change after facing a persuasive attack due to IT conflict contagion.

In the IS literature, attitude toward using technology is referred to individual's overall affective reaction to using a system (Venkatesh et al., 2003). This construct is closely associated with four constructs in the existing IS acceptance and resistance models: attitude toward behaviour (TRA, TPB/DTPB, C-TAM-TPB), intrinsic motivation (MM), affect toward use (MPCU), and affect (SCT). For instance, some of these models (e.g., TRA, TPB/DTPB, and MM), the attitude construct is among the strongest forecaster of behaviour intentions (Davis et al., 1989; Fishbein and Ajzen, 1975). For example, Chau and Hu (2002, p. 307) posit that attitude is the second most important factor of a physician's intention for accepting

telemedicine technology. Nevertheless, in other models, such as C-TAM-TPB, MPCU, and SCT, the construct of attitude is not significant. Moreover, Taylor and Todd (1995a, b), Thompson et al. (1991), and Jackson et al. (1997) find no empirical evidence as for the link between attitude and behaviour intention. Also, Venkatesh et al. (2003) argued that because the effect of attitude has been captured by the performance and effort expectancies, attitude has, therefore, no significant influence on users' behavioural intention. Nevertheless, in my thesis, I referred to the ABC model of attitudes (LaPierre, 1934), where attitudes structure can be defined in terms of three components: 1) Affective component; 2) Cognitive component; and 3) Behavioural component. My findings in Cycle 3 revealed that the affective component referred to the emotional aspect of the attitude which was very often "deep-rooted" and resisted the most to change. The cognitive component referred to the employees' system of beliefs, perceptions, values and stereotypes about the PMT. This type of attitude was more "dynamic" as it witnessed a change at several employees during the post-attack phase (see Table 47, p. 199). Third, the behavioural component often reflected the tendency to react towards PMT in certain specific ways (what the employee does or react, or what s/he said s/he will do). The more obvious attitude component was the behavioural one as it was easily observed. It is interesting to mention that my observations revealed an internal and inter-dependence of the attitude components. These components were related and unitedly formed the employee's general attitude. Moreover, a change in one attitude component was likely to produce a change in other components, to maintain internal consistency within the whole attitude structure. This was more the case of the two individuals that negatively changed attitude (positive during the post-treatment phase, to negative during the post-attack phase). Indeed, the two individuals showed "negativity" in all their attitude components to be in an internal consistency within the total "negative" attitude structure. Therefore, in contrast with some models of IT acceptance and resistance (such as C-TAM-TPB, MPCU, and SCT), my findings reveal that the construct of attitude is effective.

Furthermore, most of the models in the IS literature aim to predict users' IT adoption (and therefore attitude) before implementation. Instead, Inoculation interventions rather aim to protect or reinforce (instead of predicting) the employees' positive attitudes during IT implementation. Moreover, my observations revealed that Inoculation interventions could also be used after implementation to preserve the "positive" attitudes of new employees that recently joined the firm from being "contaminated" by individuals with "negative" attitudes. Also, the IT acceptance and resistance models found in the literature do not make the distinction between the different attitude components. Instead, they refer to attitude as only one component,

having no meaningful impact on users' behavioural intention. My observations in Cycle 3 revealed an alternative view. Although a "positive" change (- to +) in the affective component and cognitive components of some interviewed employees (e.g., P1, P2, P3 and P8) did not induce a "positive" change in their behavioural attitude component, Inoculation succeeded in adjusting their attitude in the desired direction while protecting them from further attack-induced consequences.

As for the two employees that negatively changed attitudes during the post-attack phase (P17 and P21), my observations are in line with the findings of Kimura et al. (2008), who argued that emotional contagion may be particularly salient in the case of friends, as individuals are highly tempted to be oriented toward their significant other's emotions. Moreover, although the two employees worked at two different work sites (Paris and Montpellier), they have succeeded to exchange "negative" emotional flows (Ekman, 1982) even with absent explicit knowledge about the behaviours of each other. Accordingly, my findings put forward the ability to empathize with one's important human beings, which makes him/her especially vulnerable to mimicking or adopting their behaviours (Hatfield et al., 2009) or even confounding other individuals' emotions with one's own (Aron and McLaughlin-Volpe, 2001), even if they are not geographically close.

Finally, my observations also contribute to the work of McGuire (1964), in the sense that, an attack message causing a feeling of threat, may be induced through an individual other than the attacker himself. The developers of the PMT were not "detractors" of the PMT; they were rather the "prime" advocates of the tool. They succeeded to transmit and induce a feeling of threat to the individuals that were surrounding them because they have been complaining about other consultants rejecting the PMT. Similar to a threat occurring from a "direct" attacker, the participants succeeded to form counter-arguments to defend their existing established attitudes. In other words, after the Inoculation intervention, the complaints made by IT-advocates on IT-detractors served as a trigger of threat for recently-hired employees, which in turn, activated their "psychological defence" system causing them to state counter-arguments defending their existing established attitudes. Some similarities can be made with the spread of rumours in organisations, defined as instrumentally relevant information statements that circulate among employees (Bordia and Difonzo, 2005). Indeed, feeling "threatened", constitutes fertile grounds for the spread of rumours, according to the same authors. Moreover, rumours have numerous roles in social behaviour. They assist in making sense of uncertain and threatening circumstances, as well as justify and garner support for collective action (Bordia and Difonzo, 2005). Rumours may act to enhance employees' status, filling gaps in social

conversation within an organisational setting (Hicks, 1971). Moreover, workplace rumours are systematic and can be spread faster than the organisation's formal communication channels. Accordingly, my results suggest that the designers of Inoculation-based IT training sessions may emit rumours as "complaints" on IT-detractors, as a mean for triggering the defence system of individuals with "positive" attitudes toward an IT tool, before the actual conflict contagion attack occurs.

CONCLUSION

In this last chapter, I discuss the limitations of the current work and I bring the thesis to a conclusion. The chapter points out limitations of the action research project, and also outlines directions for future studies.

Conclusion
Limitations: - I had little control over the timing of the research process; - I often felt that I needed to provoke to myself a state of "schizophrenia" while guarding me against actually having the symptoms of the illness; - I cannot claim any generalisation of the results, such as I would have if I had used several case studies or sample quantitative analysis; - If Efficient Innovation Corporation ever has to use the Inoculation-based IT training sessions again, I am not sure that it would obtain the same results; - I could have induced some interpretative biases on the feelings expressed by interviewees; - My presence might have impacted the way the participants behaved during the training sessions; - The processes observed may continue to evolve (positively or negatively) after the end of the research investigation. **Future research headings:** - I invite researchers to explore how IT project management supports IT conflict contagion identification before IT implementation resulting in an enhanced appropriation of IT; - I also invite them to expand knowledge on the use of Inoculation theory in the context of IT implementation, by directly contributing to the theory itself in the IS context; - If resistance behaviours are not considered as being systematically negative for organisations, then, could conflict contagion be considered in the same vein? - If yes, the challenging question is not so much how to prevent contagion phenomena, but rather, how to manage them.

This research, using action research methodology and a combination of interpretive and constructivist approaches, provides the information systems community with an understanding of the issues related to conflict contagion mechanisms between two or more IT projects in a firm's IT portfolio. It also provides a model of Inoculation-based IT training sessions to enhance future IT users' technical skills while guarding their "positive" attitudes against possible change "attacks". The project was undertaken in a French management consulting firm called Efficient Innovation Corporation. Although this research was carefully prepared, I am still aware of its limitations and shortcomings.

First, the study of data quality from within a firm using action research requires that the researcher abides by the rules of the organisation. In my case, I was a member of staff, and this had an impact on the research process. I was often confronted with the fact that I had little control over the timing of the research process and was often less able to be methodical, having little control over impacting work priorities. Although having full support from the top management, there were important competing priorities on my schedule as a researcher. Moreover, the director-general, who was my "field" director, he provided me an essential guidance as well as the resources required to undertake the research. That said, there were considerable delays in the research which influenced the progress of the thesis. Nevertheless, the advantages of working within Efficient Innovation Corporation outweighed my frustrations. Being a member of the firm's staff had rapidly given me an in-depth understanding of the management consulting background, having trained as a management consultant myself, provided an extensive understanding of the challenges facing the organisation and domain knowledge when discussing IT implementation issues in such organisational structures. It is less likely that an "outsider" could develop such a depth of understanding in such an environment in a limited time frame.

Second, other early "struggles" occurred in my PhD, as I tried to identify then select an appropriate research methodology, method and research design to use, as well as the best data collection techniques, and the most "healthy" role for me to play as both as PhD student and a staff member of the firm. In a few words, I often felt that I needed to provoke to myself a state of "schizophrenia" while guarding me against actually having the symptoms of the illness. Although I was satisfied with the idea of being in such a state, I was unsure of how I was going to justify my research as "real" research, as it sometimes "struggled" to fulfil all of the requirements of the action research model I had intended to follow (see Table 28: A Matrix of the Five Principles and Thirty-One Criteria of CAR, p. 108). A major concern was the feeling

that I had lost the thread of my thesis, that the essential focus of my research problem had changed beyond recognition. At first, I thought that moving from being concerned about task-oriented and socio-political oriented conflicts toward IT tool “A”, to being concerned about conflict contagion mechanisms coming from a different IT system “B” at the firm, would be a serious flaw in my thesis. Nevertheless, as my supervisor pointed out to me, the changes in my research were, in fact, signs that "good" action research was taking place. Accordingly, with action research, an essential factor is that the research is flexible toward the organisational problems as they are perceived in the particular situation, rather than being fixed to some predetermined objective which may turn out to be inappropriate. Hence, my action research was eventually not weakened but rather reinforced by being responsive as they emerged in the practical situation.

Third, and this time from a less pragmatic point of view, action research methods suggest creating knowledge as sense-making between researchers and practitioners, concerning a specific problematic organisational situation. That said, depending on epistemological postures, action research leads several limitations (Baskerville and Wood-Harper, 1996) like the lack of the researcher’s impartiality, lack of rigour, the image of “consulting masquerading as research”, context-bounded research, etc. Nevertheless, these problems are not limited to action research but are general issues of social science research (Baskerville and Wood-Harper, 1996). My research employs in-depth research, vs cross-sectional data collection, to enquire about the dynamic nature of conflicts, conflict contagion mechanisms, users’ resistance, as well as to enquire about the impact of Inoculation on attitudes, during project steps (before, during and after IT implementation). Thereby, I trust that IS researchers should consider IT conflict contagion as exploring additional influencing factors of IT adoption to expand existing IS theoretical models. The AR project at Efficient Innovation Corporation served as one case study to observe how conflict situations associated with a new IT project evolved with time, as it had been impacted by ongoing conflicts toward another IT system at the firm. Accordingly, I cannot claim any generalisation of the results, such as I would have if I had used several case studies or sample quantitative analysis. That said, the question of generalisation is rather asked when researchers use quantitative analysis. In my case, I am not sure that the possibility of results’ generalisation is a limitation, academically speaking, as I do not seek to “objectivize” knowledge. Instead, I strive to draw meaning in action and through action with whom research in management is interested in: managers. Even if my research is limited to one single case study, it still discusses the IT conflict contagion issue that the firm was facing, but also the change management method (Inoculation) acted to stop the “negative” contagion phenomenon.

The possibility of generalisation is not abandoned. Indeed, the research of Lee and Baskerville (2003) shows that there is always a way to reach a particular type of generalisation. In my case, I get to the generalization type of "Empirical to Theory". More precisely, the IT conflict contagion conceptual framework, the IT conflict contagion matrix, and the framework of Inoculation to resistance to attitude change, that all assisted me to interpret my findings can also be used as a lens to be tested in other IT deployment projects. In other words, in accordance with the empirical to theory model, other researchers in charge of IT implementation could use the research-based models developed in this thesis, to capture further results on possible IT conflict contagion and on the effect of Inoculation technique. That said, I cannot assume that other change management methods would not have given more positive results than Inoculation theory. Additionally, if Efficient Innovation Corporation ever has to use the Inoculation-based IT training sessions again, I am not sure that it would obtain the same results. For instance, one can imagine that Inoculation may produce habituation, dependence, addiction, or even a "virus mutation" in terms of propagation. I cannot confirm, either, that applying such Inoculation-based IT training sessions in other organisations would provide the same positive results.

Fourth, data were mainly collected through interviews that could have induced some interpretative biases on the feelings expressed by interviewees. Nevertheless, I tried to reduce these issues by interviewing several employees of each department and by adding several informal discussions and meetings. Moreover, I employed the respondent validation technique, which is to allow the interviewees to read through the data and analyses and provide feedback on my interpretations of their responses. This provided me with a valuable method of checking for inconsistencies, which challenged my assumptions and provides me with an opportunity to re-analyse the data collected. I also did a constant comparison of data, that one piece of data (for example, an interview) was compared with previous information and not considered on its own. This has enabled me to interpret the data collected as a whole rather than fragmenting it. The constant comparison also allowed me to identify emerging/unanticipated themes within the research project, which allowed me to assume that conflict contagion occurred between individuals at the firm. On the other hand, qualitative research may also be criticised as biased, small scale, anecdotal, and lacking rigour; however, if carried out with honesty and genuineness, it is unbiased, in depth, valid, reliable, credible and rigorous. Accordingly, in Cycle 2, to tackle the question of the validity of my research findings (and therefore question the extent to which my findings were an accurate representation of the phenomenon they were intended to represent) I used Triangulation. Indeed, different sources of data gave me different

views or vantage points via triangulation to deeply enquire about a concept, to develop its properties, and to enhance the construct validity of the research, through "Validation Groups". These groups consisted of the firm's DG, HR manager, Mr Dupont, Ms Lepoux, the consultant that was in charge of IT maintenance when the ERP was implemented in 2009, and myself.

Last, in both Cycle 2 and 3, data were also collected through observation techniques, especially during the Inoculation sessions. My presence might have impacted the way the participants behaved during the sessions. While it is probable that the participants' behaviour might have been impacted, the observation process was more "realistic" as I communicated clearly from the beginning, that my role was to work on continuously improving IT training sessions at Efficient Innovation Corporation, for the sake of the junior consultants that were joining the firm. On the other hand, another possible limitation of the longitudinal research is that the processes observed may continue to evolve (positively or negatively) after the end of the research investigation (Volkoff et al., 2004, p. 302). Perhaps a way to tackle this limitation would be to further approach Inoculation in social science to vaccinations in medicine, and consider "booster vaccine", which is a re-exposure to the immunising "dead virus", to increase immunity against that virus back to protective levels, after memory against that virus has declined through time. Such a holistic way of managing IT-induced change can be beneficial to tackle the limitation of the process's evolution after the end of the research investigation. Hence, further research should be done to extract findings in other types of organisations, larger firms, or other professional and organisational contexts to provide a further understanding of IT conflict contagion in firms' IT project portfolios and on ways to manage this negative phenomenon through Inoculation-based interventions.

In this thesis, I proposed a conceptual framework that takes into account the contagious nature of conflicts as well as their mechanisms between different IT project teams and distinct IT projects. Although numerous IS studies tackle user resistance and conflicts by anticipating, minimising or even boosting these negative behaviours, little research has taken into consideration the contagion mechanisms of conflicts and examined why and how users similarly resist to different IT implementation projects. Moreover, research on "change management" or "user resistance management" is sparse on using attitude Inoculation to tackle the IT conflict contagion issue. This approach served as the key foundation for the action research case conducted at Efficient Innovation Corporation, a French innovation management consulting firm. The cyclical method used, explored users' resistance and conflict contagion situations before and during IT implementation, but also attitude Inoculation in the post-implementation phase. The research questions included an inquiry about IT conflict contagion

between different individuals working on distinct IT projects. They also included exploring an Inoculation-based interventionist approach during IT implementation, whether it would maintain and reinforce "positive" attitudes against conflict contagion attacks. For IS practitioners, my research gives greater attention to issues related to ongoing and prior conflicts occurring in a firm's IT project portfolio. Indeed, identifying potential conflict contagion mechanisms turns out to be consistent with the change management style to adopt.

The medical analogy of Inoculation is commonly used to illustrate Inoculation Theory, as I have done here by applying it to the field of IT. For managers, training programs that include an Inoculation treatment may improve the resistance of those with existing "positive" attitudes about the IT tools in a firm. I argue that it is essential to focus on preemptive strategies to prevent "positive" individuals from being contaminated because of the firm's conflicting environment. Also, Inoculation could be beneficial to persons who are already "infected", unlike in the medical field, where a doctor typically does not immunise a patient who already has a disease, for fear that the patient's condition will worsen. Although Inoculation has established itself as a powerful communication theory, I contend that IS scholars have not yet explored the full potential of Inoculation-based messages, despite theoretical rationale (e.g., Compton, 2013), message development guidance, and empirical support in other research domains (e.g., Health) (e.g., Banas and Rains, 2010). As future investigations, I invite researchers to explore how IT project management supports IT conflict contagion identification before IT implementation resulting in an enhanced appropriation of IT. I also invite them to expand knowledge on the use of Inoculation theory in the context of IT implementation, by directly contributing to the theory itself in the IS context.

I invite IS researchers and managers to reconsider their perceptions of: (1) resistance, and (2) contagion. If they do not consider the first one as being systematically negative for organisations, then, could they consider the second one in the same vein? If yes, the challenging question is not so much how to prevent contagion phenomena, but rather, how to manage them. This posture can make sense in a complex environment in which IT (e.g., ERP, Cloud, Big Data, etc.) are more and more piled up in organisations (Kalika et al., 2007) while being interrelated in their use. Despite their differences regarding objectives and functionalities, the way they are perceived may go beyond this sort of boundaries. Hence, a first step would probably be to switch from IT project change management methods confined to their respective perimeters to a portfolio-based approach more adapted to the « butterfly effects » of resistances.

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List of Publications

1. Bou Saba P., Meissonier R. (2017), "Fighting Fire with Fire. Inoculation after IT Implementation", 22ème colloque de l'Association Information et Management, 17-19 may, Paris, France
2. Bou Saba P., Meissonier R. (2016), “IT Conflict Contagion: action research during IT deployment”, Information Technology and People (First Round)
3. Bou Saba P., Brouwers S. (2016), “Using a decision support tool for R&D portfolio management: going beyond initial expectations”, Euromed Journal of Management, Vol. 1, No. 3
4. Bou Saba P., Meissonier R. (2016), "Conflict contagion effects from previous IT projects: action research during preliminary phases of a DST implementation project", 21ème colloque de l'Association Information et Management, 18-20 mai, Lille, France (Best paper award)
5. Bou Saba P., Meissonier R., Brouwer S. (2015), "The Role of External Consultants in R&D Project Selection, and the Contributions of a Decision Support System", 20ème colloque de l'Association Information et Management, Rabat, Morocco