

FIGHTING FIRE WITH FIRE. INOCULATION AFTER IT IMPLEMENTATION

Research Paper

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Abstract

The goal of this paper is to observe whether inoculation messages help management consultants maintain pre-existing neutral or positive attitudes toward a recently-deployed IT, while guarding against undue conflict contagion from negative messages that they might hear from their colleagues. We examine attitude contagion in the face of prior conflict experience in the firm through action research project conducted at Efficient Innovation (a French leader in management consulting). First, our observation reveals that employees expressing task-oriented conflicts toward IT deployment are likely to use a bypassing strategy and manifest only socio-political conflicts. Second, our study delivers an observation of a contagion effect from previous conflicts occurred during the deployment of an Enterprise Resource Planning (ERP) system. Third, using a theoretical perspective from the attitude change and persuasion literature called “attitude inoculation,” a set of techniques for maintaining a strong-resistive attitude in the face of persuasive messages, has led to espousing a contrary position, resisting to negative persuasion (contagion) attempts and attitude change. Our practical goal is to provide advice to IS managers on how to manage contagious conflict behaviours toward IT tools through an inoculation intervention.

Keywords: Inoculation theory, Conflict contagion, Attitude change, IT deployment.

1 Introduction

Information Systems (IS) research provides rich knowledge to tackle Information Technology (IT) project failures. 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. 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). Then, literature observed and conceptualised active change management styles to reduce human conflicts during or after IT deployment (Markus et al., 2000). Furthermore, some researchers provided a framework to anticipate conflicts prior to IT deployment by maximising conflict instead of reducing it (Meissonier and Houzé, 2010). On the other hand, examining the effectiveness of various methods of inducing resistance to persuasive messages and attitude change has been a longstanding topic of interest among scholars of social influence (McGuire, 1961). McGuire's (1962) Inoculation Theory, shows great potential for investigating a firm's ability to resist to conflicts occurring towards 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, 1961) 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 efficacious stratagem. Prior work on the subject include alcohol consumption prevention (Godbold and Pfau, 2000), commercial advertising (Pfau, 1992), political campaign issues (Pfau and Burgoon, 1988), public relations issues (Wan and Pfau, 2004) and sexual harassment (Matusitz and Breen, 2006). Accordingly, the goal of this research is to examine whether inoculation messages help management consultants maintain pre-existing positive attitudes towards a recently-implemented IT, while guarding against undue conflict contagion from negative messages that the latter consultants may hear from colleagues. In organisational teams, the latter 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 come to also infect, or involve, other group members over the course of time. Accordingly, the objective of this article is to tackle conflict contagion behaviours occurring after the implementation of Decision Support Tool (DST) tool. The rest of the article is structured as follows. A literature review analyses the conceptual basis of user resistance, conflicts, and the potential contagion effect between employees. The case study analysis delivers the results of a 3-year action research project conducted at Efficient Innovation (a French leader in innovation management consulting). First, our observation reveals that employees expressing task-oriented conflicts toward IT deployment are likely to use a bypassing strategy and manifest only socio-political conflicts. Second, our study delivers an observation of a contagion effect from previous conflicts occurred during the deployment of an Enterprise Resource Planning (ERP) system. Third, using a theoretical perspective from the attitude change and persuasion literature called "attitude inoculation," a set of techniques for maintaining a strong-resistive attitude in the face of persuasive messages, has led to espousing a contrary position, resisting to negative persuasion (contagion) attempts and attitude change. The discussion part details these observations made over a period of three years. In conclusion, examining the phenomenon of conflict contagion, beyond task and socio-political causes of IT deployment failures, has a variety of implications for both theory and practice. Theoretically, by looking at previous factors that could lead to conflict contagion in a group, researchers may better understand why, when and how conflicts evolve to affect new group members. From a managerial perspective, identifying previous conflicts, managers can work to more actively contain and resolve conflicts before they have a chance to affect the rest of their team through special training sessions containing Inoculation messages. In conclusion, our practical goal is to provide advice to IS managers on how to manage conflict behaviours toward IT tools through an inoculation intervention.

2 Literature review

Our analysis, both based on the ‘conflict-oriented’ character of our research field, and on the Theory of Reasoned Action (TRA), considers that resistance is a behavioural dimension of conflict, where individuals express a conflict through resistance acts (Ajzen and Fishbein, 1980; Meissonier and Houzé, 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 come to also infect, or involve, other group members over the course of time (Barsade, 2002). While an abundance of research in social psychology has proposed theories and methodologies to manage conflicts occurring between employees (Meissonier and Houzé, 2010), little research in IS has discussed the contagion mechanisms of such conflicts during IT deployment and how to resist to the latter conflict contagion phenomenon using inoculation techniques.

2.1 User resistance

Theories that tackle user resistance toward IT deployment, during different phases, have been witnessing development over the past 10 years (Lapointe & Rivard, 2005; Ferneley & Sobreperez, 2006; Kim & Kankanhalli, 2009; Klaus & Blanton, 2010; Van Offenbeek et al., 2013). Behaviour is the primary dimension of resistance (Lapointe & Rivard, 2005). Resistance occurs when a person perceives a situation as inequitable, and therefore perceives changes involved because of an unfair IT deployment project, in regard to personal or group matters. User resistance is more specific than overall resistance to change because it consists of employees interacting with a system (Klaus & Blanton, 2010). Klaus and Blanton defines user resistance as ‘behavioural expression of a user’s 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 called psychological foundations that date back as early as the 1980s (Markus, 1983). According to Markus (1983), user resistance could be examined through three approaches: 1. technical-oriented; 2. people-oriented; and 3. power-oriented (see Table 1).

Approach	Principle	Authors
Technical-oriented resistance	Resistance occurs because of technology-related factors such as user interface, security, ease of use, performance and centralisation degree.	Markus (1983); Jiang et al. (2000); Meissonier & Houzé (2010)
People-political resistance	Resistance occurs because of backgrounds, traits and attitude towards technology of individuals or groups.	
Power-oriented resistance	Perceived social losses because of technology affect user resistance, because of changing power relationships between employees, social and job structure.	

Table 1. User resistance

According to Venkatesh & Davis (2000), user resistance is considered as the opposite of acceptance. Conversely, other authors such as van Offenbeek et al. (2013) and Meissonier & Houzé (2010) observed how users can similarly accept and resist to IT. Lapointe & Beaudry (2014) finally 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’. At the group level, user resistance is more often to be socio-political oriented (Krotov et al., 2011), whereas at a more individual level, it is more psychological (Markus, 1983; Meissonier & Houzé, 2010). On the other hand, employees may perceive the threats of a same system differently (Markus, 1983).

2.2 Conflict contagion

Research considering conflicts as a behavioural form to express resistance (Ajzen and Fishbein, 1980; Meissonier and Houzé, 2010) are about the object on which resistance is occurring as well as the respective perceived threats; see Table 2. Conflict is a disagreement of persons or group of persons that perceive a situation as being incompatible with their own interests (Ajzen and Fishbein, 1980). 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. In this research, we look at how interpersonal, or dyadic, conflicts may unfold in or between groups and show how by understanding the occurrence and spread of these conflicts, we may gain a more multi-faceted knowledge of conflicts caused by IT deployment in or between groups. We 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 progression and evolution of a conflict in and between teams over time, from involving just a few members to drawing in the firm. While many frameworks of conflict behaviours exist, they generally comprise actions as engaging in process control, forcing, confronting, accommodating, compromising, problem solving, and avoiding (Meissonier and Houzé, 2010). Intra-group and inter-group conflicts may be associated with a DST deployment project, and therefore our literature analysis in IS allows us 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 & Rowe, 2001). In this paper, we suppose that employees having task-oriented conflicts associated to IT projects are likely to use a bypassing strategy and manifest only socio-political conflicts. Respectively, we formulate the first research proposition.

Proposition 1: Actors expressing task-oriented conflicts toward IT deployment are likely to use a bypassing strategy and manifest only socio-political conflicts.

On the other hand, because conflict perceptions are transmitted to other group members through behavioural actions (Jehn et al., 2013), such behaviours may also lead other individuals of a same group to behave in a conflictual manner (Jehn et al., 2013). Moreover, as the conflict contagion process progresses, issues that could affect outcomes for all the groups in the firm may become more salient (Jehn et al., 2013). In the case of IT deployment, such factors may serve to include the remaining 'peaceful' or 'neutral' individuals (Jehn et al., 2013), to engage in conflict behaviours toward the same conflicted IT, or toward a totally different IT. The conflict contagion process is most likely to occur because of interdependence between individuals (Lewin and Lewin, 1948; Langfred, 2000). Since mutual dependence among individuals is crucial for group building (Lewin and Lewin, 1948; Hackman, 1987), an issue that affects a few members is likely to affect all team members over time, because of coalition formation and emotional contagion.

Conflict form	Description	Authors
Conflicts about the IT system	Conflicts about the design of the IT itself, including its functionalities.	Davis et al. (1989); Venkatesh and Davis (2000)
Conflicts about the task that employees must fulfil	Conflicts caused by the way firms' processes must be changed or adapted to fit with the new IT process requirements.	Besson and Rowe (2001); Lim et al. (2005)
Conflicts due to cultural principles	Psychologically-based conflicts referring to employees' ideologies by which they share beliefs and make sense of	Trice and Beyer (1993); Stewart and Gosain

	their words.	(2006)
Conflicts due to a loss of power	Conflicts associated with the way how hierarchical authorities and management are likely to be reformed after IT implementation.	Davis et al. (1989); Meissonier & Houzé (2010)
Contagious conflicts	Conflicts of any of the forms above, are transmitted to other group members through behavioural actions. Conflict behaviours may lead other individuals to behave in a conflictual manner.	Lewin (1948); Yang and Mossholder (2004); Jehn et al. (2013)

Table 2. User conflict forms

Coalition formation occurs when two or more individuals jointly act to impact the objectives of other individuals or groups. 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 with socially similar individuals is indeed a robust finding in the social psychology literature (Phillips and Loyd, 2006) and also includes conflict situations. Additionally, persons involved in the initial conflict may also proactively recruit other persons 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 ‘neutral’ individuals become behaviourally involved in the conflict through the process of emotional contagion (Barsade, 2002). The relationship between emotional 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, emotional contagion, in addition to coalition formation, is another mechanism by which inter or intra-group conflicts may lead initially uninvolved individuals to behaviourally engage in a conflict. For instance, in this article, we assume that users experiencing conflicts toward an existing IT are likely to develop a conflict contagion effect, consciously or unconsciously, and spread conflict behaviours, to other individuals, but also to neutral persons working on a totally different IT. Accordingly, we formulate the second research proposition.

Proposition 2: Firm’s prior conflict behaviours may be contagious and transmitted to consultants, intended users of a new IT tool.

2.3 Inoculation theory

The framework of Inoculation Theory is particularly suitable to tackle the research propositions in this study (McGuire, 1962). Inoculation is an effective strategy as it first allows consultants to be influenced by persuasion. When these participants are faced with the same arguments in the future, they will generally disregard or ignore the arguments because their strengthened – or inoculated – attitudes both unconsciously and consciously resist them (Miller, 1972). The core of inoculation theory is a medical metaphor (McGuire, 1961). In medical immunization, weakened forms of viruses are injected into the blood, and through cell adaptation, the body then reacts to this injection protecting itself from future attacks from stronger versions of that virus (McGuire, 1962). Accordingly, the same way an individual’s immune system can be vaccinated (inoculated) against viral attacks, human behaviours could be inoculated against negative influential 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 this forewarning, the latter teens receive a handful of potential counterarguments they might face from their peers (e.g. “You will certainly hear others saying that Ecstasy gives you wings, and it is completely 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.”

Inoculation Theory posits that inoculating people through well-crafted messages enable them to resist when needed (McGuire, 1962). 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 specific situation or circumstance (i.e., behaviours, practices, religion, etc.) weighted by the personal evaluation of the latter opinion (Ajzen, 1980). In the context of inoculating individual's existing attitudes, humans can be the targets of carefully designed inoculation treatments that maximize the strength of their current attitudes and enable them to refuse embracing communicative messages that are attitudinally dissimilar (Breen and Matusitz, 2012). Inoculation messages involve two primary components that foster attitudinal resistance among recipients: threat and refutational preemption. Pfau and Van Bockern (1994) argue that both these elements are essential in order to confer resistance to subsequent persuasive messages. However, Inoculation Theory posits that it is crucial for an individual to experience a threat in order to be inoculated against a subsequent attack. Thus, threat towards an individual's beliefs is at the heart of Inoculation Theory. It is a key motivational element that causes individuals to defend their beliefs in a process called counterarguing that strengthens attitudes and behaviours against influence by elaborating and strengthening the network of beliefs that support the attitude (Pfau, 1992). In addition to threat, the second essential element of inoculation messages is the refutational preemption. Pfau (1992) argues that refutational preemptions provide specific content that receivers can employ to strengthen attitudes against subsequent change. In this regard, refutational preemptions assist the inoculation process by providing arguments that can be employed to refute arguments presented in future attitudinal attacks. It also gives individuals practice at defending their beliefs through counterarguing (Compton and Pfau, 2004). The 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 2).

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

Table 3. The 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 a great attention in the fields of social sciences and social psychology (Eagly and Chaiken, 1993). According to Fagnot and Stanton (2015), an attitude has three components: behavioural, affective and cognitive; however, the attitude may be more strongly based on one component than another. The behavioural component – the one of greatest interest to the proposed study – is an individual's actions toward the attitude object. The affective component is one's emotional reaction towards the attitude object. The cognitive component is one's thoughts and beliefs about the attitude object. Accordingly, in our case, an example of an attitude might be the opinion a management consultant has concerning the use of IT tools in a firm. In this case, the attitude object would be the perceived importance of such tools in daily routine work, and the intention to use them in general. Therefore, we suggest the third research proposition.

Proposition 3: Consultants that are exposed to inoculation treatment will increase their resistance to attitude change.

The behavioural component would consist of attempts to find solutions to not using these tools, convincing other consultants to do the same and engaging them into conflict. The affective component of such an attitude might be mistrust in machine-based decision support systems or fear concerning loss of power as a consequence of using the latter IT tools. Finally, the cognitive component might consist of thoughts comparing the proposed tools to other existing IT in the firm, in terms of their impact and usefulness in his work.

3 Case description

Efficient Innovation (EI) is a French consulting firm specialized in innovation management. The firm has offices all over France. It provides both human and technical services in the management and financing of technological innovations, to clients ranging from start-ups to large multinational firms, such as Airbus Group, Michelin, Thales, Siemens, etc. Established in 1998, the company employs 80 persons (Ph.D. holders, engineers, financial and fiscal analysts, and administrative assistants) spread over several subsidiaries in France and abroad (Paris, Lyon, Montpellier, Sao Paulo). One of EI's main activities is R&D project portfolio management. The firm applies project prioritization and selection methodologies in its assignments, using both human and IT-based tools and algorithms. The IS of EI relies on two different parts: 1. an Enterprise Resource Planning system (ERP) deployed in 2009, which aims to manage finance and day-to-day operations, knowledge management, absence and presence sheets, assignment planning, progress monitoring, profitability, as well as integrated reporting and dashboards; and 2. decision support tools (DSTs), Excel sheets using macros, usually developed in-house progressively by ad hoc initiatives, through independent and isolated developments whenever a 'motivated' consultant has free time. DSTs aim to assist consultants with their day-to-day decision making assignments. The latter isolated, distinct and independent developments have involved a lack of data and tool coherence as well as an excessive growth of applications. The latter part of the firm's IS is structured around a huge quantity of office files from which data must be manually extracted by consultants at different work sites. Consequently, this was highlighted by data access problems. For example, a consultant working in Paris does not know whether a tool has been already developed by another consultant working at one of the other offices. He has to contact a consultant in Montpellier that centralizes tools from time to time, and may know how to browse the database and communicate or send the needed information. As for the most pressing and biggest DST developed in-house, the R&D portfolio management tool, only two employees (one senior, one junior) have expressed interest and motivation to develop it. The DST was initially designed because the latter employees have been complaining about lack of time and efficiency in their assignments. They must analyse hundreds of R&D projects at one client's portfolio with a pure mental activity and extensive on-sites physical presence. The tool has been tested and used a few times but has not yet been fully deployed in the firm. The tool, in its first version, had few technical and ergonomic elements still missing, according to a group of consultants working at the firm. Consequently, when other key consultants were asked by executives to use the tool, the first impression they had reflected discomfort, uselessness and demotivation. Consequently, the manager in head of the R&D portfolio management department at EI asked for an upgrade of the existing DST, through a complete review of the algorithms behind it, the ergonomic aspect of the tool as well as a redefinition of the reasons for which it was conceived. Several meetings, self-organized by advocates and non-advocates of the project, turned out to be successful, that everyone agreed on the fit between organisational needs and the tool's deliverables, generally speaking. However, when the opposing group was asked to use the DST, a conflict between them and the partisans of the tool arose. Executives at EI have been showing interest in information systems research in order to successfully engage all its employees to use the internal IT tools available. EI has one type of IT staff: consultants who have a little knowledge in IT support and handles very basic maintenance of the existing IT (computers, printers, routers, etc.). The firm has been witnessing diverse resistance behaviours and conflicts towards its IT tools since 2009, ranging from the ERP system being used only partially to excel-based Decision Support Systems (DSTs) being totally refuted by a large group of consultants despite their claimed strategic importance and effectiveness in daily consulting tasks. Therefore, this case study was consistent with our research objective and represented an opportunity to observe how conflicts are contagious and how the latter negative behaviours could be treated through an inoculation intervention.

4 Research design and results

Action Research (AR) has been promoted and practiced as one way to conduct empirical research within the IS discipline. AR in IS is an applied research to develop a solution that is of practical value to the persons with whom the researchers are working. Since conflicts in organisations evolve over time, it justifies that process analysis is more adequate than static analysis (Meissonier and Houzé, 2010). Because our research proposition is difficult to assess in a quantitative manner, qualitative analysis was deemed particularly appropriate for examining resistance and conflicts towards the IT project. Focusing on our research field's characteristics, and aiming to bridge the gap between research and practice, AR encompasses action outcomes and research outcomes. The research design of Susman and Evered (1978) is one of the most action research method used in social sciences (Meissonier and Houzé, 2010). The method relies on a cyclical process in five steps: 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. Despite that other research methods could have been used to analyse this research object in its natural context, action research was the most appropriate because of its interventionist approach dedicated to the development of knowledge useful to research and practice (Susman and Evered, 1978). When our AR assignment started, we were not aware of any preconceived propositions that could have been formulated to assume the mechanisms of conflict contagion which the firm was witnessing. The following paragraphs address each of the three cycles and their respective methodologies and results. We present the AR methodology used (Susman & Evered, 1978) as well as the results of the cyclist process of analysis that lead to the identification of user resistance and conflicts determinants. We integrate information collected from the in-depth interviews and informal discussions with key persons involved in the research. We also cross these data with user resistance, conflicts, conflict contagion literatures and Inoculation Theory. Table 4 sums the research process and results of cycles 1, 2 and 3.

	<i>Cycle 1 (02/14 – 04/15)</i>	<i>Cycle 2 (04/15 – 02/16)</i>	<i>Cycle 3 (02/16 – 12/16)</i>
Diagnosing	<i>Objective:</i> Explore the existing DST to understand its technical characteristics and clarify conflicts towards the first version of the DST expressed by two opposing groups; 'Go or no Go decision' for the deployment of the new version.	<i>Objective:</i> Enquire about conflicts toward the existing ERP system in an attempt to solve them. Find a consensus to encourage opposing consultants use the recently-deployed DST.	<i>Objective:</i> 'Go or no go decision' to use Inoculation to tackle conflicts and conflict contagion toward both ERP and DST.
	<i>Sources:</i> 8 open-ended interviews with key actors at EI; Existing documentation on the DST project; Informal discussions; Academic literature.	<i>Sources:</i> 13 open-ended interviews with key actors at EI; Informal discussions; Academic literature.	<i>Sources:</i> 18 open-ended interviews; Direct day-to-day observations; Academic literature; 24 Informal meetings and discussions with participants; questionnaire on the general perception of IT tools in the firm.
	<i>Data analysis:</i> During several sessions with EI managers and key employees, direct observations, verbal and non-verbal communications were noted by the researchers.		
Action	Identifying both technical-	A 3-day seminar called 'school	Organise Inoculation

planning	oriented and socio-political oriented conflicts; Analysing EI's culture; Process analysis for the new version of the DST.	of innovation' was organised by a recently-hired independent researcher in psychology with the presence of the firm's president, the firm's director general, as well as both senior and junior consultants.	interventions in attempt to solve conflict contagion issues at EI. 15 open-ended interviews were planned with participants before exposure to Inoculation messages, and 15 other interviews 1 month after exposure.
Action taking	The purpose is to rapidly adapt the tool's characteristics taking into account the wishes/tasks of the 'DST-opponent' individuals then implement the new version on a large scale at EI; A 'change session' organized with key actors associated with the DST project. Individual interviews of key anti-IT consultants initially invited to the 'change session'; 'Go decision' concerning the implementation of a new version of DST.	The purpose was to enhance internal communication and explain to consultants the strategic importance of using and filling the firm's ERP. The IS researchers participated in the seminar for observation purposes, and to hold unofficial conversations with the participants.	'Go decision' concerning Inoculation intervention. Five 'IT training sessions' were made with an attendance of 15 consultants per session in average. The latter sessions had the purpose to provide technical training for consultants, both junior and senior, on using the ERP and the DST. All consultants were exposed to Inoculation messages during these sessions.
Evaluating	Conflicts were evaluated during a 'change session' and during unofficial individual conversations. Beyond the DST project, and without the knowledge of the researchers, the top management initiated a massive internal communication campaign to incite consultants to use properly a totally different IT: the firm's ERP.	A group of consultants were observed bragging about not using the ERP properly in front of recently-hired consultants and making "jokes" on the recently-deployed DST calling it "too smart to be used" and "a total waste of time".	Preliminary observations posit that during unformal discussions with the participants after the inoculation intervention, the researchers noted a general negative perception (attitude) towards the DST by the majority of consultants that have been working at the firm for at least 2 years (senior consultants). Junior consultants (<2 years in the firm) have however showed enthusiasm and "innocence" expressing no or little conflict behaviours toward the DST, but also showed positive attitude when questioned about their perception of the firm's ERP.
Specifying learnings	A socio-political oriented conflict appeared to hide task-oriented conflict - the tool was used by the DST-advocate groups as a legitimation and homogenization tool to cover multiple consultants having different skills, or lack of skills. Surprisingly, new independent issues associated to the firm's ERP system came to light. It appeared that the ERP has been successfully	By the end of 2015, the Management issued a consensus on the ERP by being tolerant and giving consultants few extra-time to fill the system with the required data, resulting in less conflicts towards the ERP. However, since 2009, conflicts have been transmitted to senior consultants and later to junior consultants through indifference behaviours, jokes	Following the inoculation intervention which took place during the training sessions, the researchers' observations were that consultants from both behavioural groups (DST-advocate and DST-opposing) showed more "seriousness" when prompted about the DST. Furthermore, DST-opposing consultants (senior consultants, >2 years at EI) were interested to learn more about the

	deployed in 2009, but has not been properly used since then because of internal conflicts between ERP-advocate and ERP-opposing managers.	and negative statements/attacks toward any type of IT in the firm, including the newly-deployed DST.	advantages of the DST by asking questions and feedback from those who already used the tool in real assignments. As for the ERP, senior consultants maintained their negative attitude toward the system one month after the Inoculation intervention. However, a large number of junior consultants showed positive attitude toward the ERP after the intervention.
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Table 4. Research process

Cycle 1

Design

The first cycle (02/14 – 04/15) at EI was to explore the existing decision support tool in order to understand its technical characteristics, then identify conflicts and resistance toward the first version of the DST. This problem-solving dominant approach (Chiasson et al., 2009) was explorative and consistent with thematic analyses in which codes were constructed inductively. Consequently, the specific purpose of the first cycle was to upgrade the technical aspects of the DST, deploy a new version and make it available to use by all consultants working at the firm. We had access to the existing technical documentation (specifications) associated with the tool. Since the tool was developed internally by the ‘DST-advocate’ consultants, the documents associated with the DST included guidelines and definitions on how and when the tool should be used. In cycle one, a total of 8 open-ended interviews were made with both DST-advocate and DST-opponent consultants. The latter interviews lasted around 35 minutes each.

Results

The interviews made with ‘DST-advocate’ consultants revealed that using the DST was designed for other purposes than those initially defined - According to Mr. Dupont, portfolio management assignment manager, the DST is very essential in the decision-making and project selection process, from the client’s point of view:

“The assigned consultants, both junior and senior 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, a DST, in this case comes as a solution to homogenise the interpretations of multiple consultants working for the same client”, stated Mr. Dupont.

In other words, whenever a DST 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 DST’s project selection. The latter assignment at BF is a ‘proof’ that ‘non-expert’ consultants are able to manage a client’s portfolio by themselves, regardless of their expertise and backgrounds.

“A decision support tool can homogenize and converge the multiple interpretations of the consultants assigned on a R&D project portfolio management task, and therefore, the very same tool can cover their lack of required skills to fulfil the assignment”, stated Mr. Dupont.

He also stated that he was worried about the lack of skills, knowledge and expertise of some consultants in the firm coming from diverse academic backgrounds. Hereby, the quest for socio-

political related homogenization appears to hide a quest for covering a lack of task-related expertise. Accordingly, these observations refer to **our first research proposition**:

“Employees expressing task-oriented conflicts toward IT deployment are likely to use a bypassing strategy and manifest only socio-political conflicts”.

Furthermore, during unofficial interviews, almost all DST-opponent consultants have repeatedly bragged their ‘senior’ positions at the firm, and made ‘jokes’ on consultants from the DST-advocate group. These jokes included statements and ‘laughers’ that the DST-advocate consultants that developed the DST obviously ‘have too much free time’ to engage in complicated IT development activities.

At the end of the first cycle, new issues came to light - this time conflicting behaviours suddenly occurred towards another existing IT in the firm: The Enterprise Resource Planning (ERP) system. The ERP has been successfully deployed in 2009, but has not been properly used since then, because of internal conflicts. Beyond the DST project, and without our knowledge, the top management initiated a massive internal communication campaign to incite consultants to start using and filling properly a totally different IT: the firm's ERP. We thus considered that resolving socio-political and task-oriented conflicts towards the DST was not possible at the moment, since the initial objectives to implement the tool successfully were involuntarily diverted towards another IT system in the company. Therefore, it would not have been possible in cycle one, to force a DST conflict-resolution strategy. We considered that it would be necessary to clarify this surprising event and to identify further conflicts that we were not aware of.

Cycle 2

Design

The second cycle (04/15 – 02/16) at EI was to enquire about conflicts toward the firm’s existing ERP system, and to identify conflict contagion effects based on our literature analysis. We decided to do so in an attempt to detect potential previous conflicts occurred toward the ERP, that may have evolved to ‘contaminate’ other consultants involved in the DST deployment project. Like in the first cycle, the problem-solving dominant approach was explorative and consistent with thematic analyses in which codes were constructed inductively. We also based our approach on day-to-day field observations, informal meetings with few of the firm’s executives, as well as on 13 open-ended interviews with key advocates of the ERP. The latter interviews lasted around 40 minutes each. We aimed to observe how resistance evolved towards both the DST and the ERP, by identifying resistance behaviours towards both systems. On the other hand, the top management hired a researcher in psychology in order to assist in transmitting best practices to new consultants joining the firm, including practices to transmit to them the strategic importance of using the ERP and filling it properly. We were invited to assist in the firm’s annual seminar on a French Riviera Island, as well as in a 3-day seminar called ‘school of innovation’, in a traditional holiday guest house in the southern French mountains, organised by the later psychology researcher. The purpose of these seminars was to foster internal communication and knowledge between consultants working at different sites (Paris, Montpellier, Lyon, Nantes, etc.). As for action taking, we considered to take the opportunity of the seminars, to hold discussions with the participants, both ‘Junior’ and ‘Senior’, ERP-opposing and advocate, and DST-opposing and advocate. We supposed that the participants would be more ‘in-ease’ to uncover inherited conflicts related to the firm’s global information system. Our data analysis was based on several informal interviews with EI managers and key employees. Direct observations, verbal and non-verbal communications were noted by the researchers.

Results

In cycle two, the discussions with a senior consultant and ‘IT guy’ at EI revealed that before 2009, the firm’s employees have been using excel sheets developed by the company’s president, for day-to-day

operations. He stated that during the 2008 world economic crisis, the director general decided to implement an ERP in an attempt to monitor and enhance the firm's operations. However, according to the 'IT guy', the company's president resisted to the deployment, and insisted on using his own excel sheets to manage operations, but later accepted the ERP's deployment. A consensus was made in 2010 on the ERP project: the director general decided to encourage using the ERP progressively, starting with the most pressing functions, showing tolerance and giving the time needed for everyone to get used to it.

"6 years following the ERP's deployment, our president today uses his self-made Excel sheets, and pays someone to fill the data in the ERP", told us the 'IT guy'.

On the other hand, more than 15 senior consultants, managers, and top management executives have accepted the ERP, and approved its deployment. However, the very same persons were reluctant to use the system, because they did not trust the data issued, and because it was too much complicated to use. These observations show that one can accept IT and not use it at the same time. The in-depth interview with the director general however revealed that only 10% of the ERP's data input capacity are required to be filled each month by the firm's staff. The other 90% are useless. However, even at a tolerance rate of 10% input data, few employees still resist to the system and finds it not trust-worthy, useless, annoying, and time-consuming. The director also stated that some employees may think that the top management is attempting to monitor and assess them, their daily activities and their productivity rates. Finally, according to the 'IT guy', the firm's culture has been witnessing indifference behaviours and inter-group conflicts, transmitted from one consultant to another, towards any new technology implemented or to-be-implemented in general, and towards the ERP in particular. When prompted on the conflicts towards the DST, he stated 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 DST, the firm's data sharing platform or even a new coffee machine, would automatically witness rejection".

Following the forced deployment of the ERP in 2009 encouraged by the company's director general, the firm witnessed resistance and conflict behaviours toward the ERP project from the firm's president and other opposing managers. Following the ERP consensus, to date, conflicts and resistance towards the ERP were reduced. However, the director general was still not satisfied of the outcome of the system, because many consultants were still not taking the ERP-filling-task seriously. On the other hand, few managers and senior consultants today still perceive the ERP as useless, inaccurate and not trust-worthy.

"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!", stated a senior consultant.

Moreover, during the 3-day integration seminar that hosted 18 recently-hired consultants, we observed that the participants expressed 'discomfort' when the training session on the company's ERP began. Discomfort was manifested through laughers, absence of precise questions, jokes and some behaviours of 'non-seriousness' toward the ERP training session. Through informal discussions with many of the participants, we noted that they had negative feelings toward the ERP, despite their relatively short journey working at EI. After the seminar, the majority of them stated that the ERP is indeed crucial, but also admitted that their senior colleagues are 'right' when they say that filling the system is time-consuming, sometimes useless, and 'pretty much inaccurate'. The researchers have observed contagious emotions: 'neutral' individuals have become behaviourally involved in someone else's conflicts, and a conflict contagion effect was observed - the firm already witnessed in 2009 bad experiences and major conflicts towards a technology project (ERP), and since then, resistance

towards any kind of new technology to be implemented, has been evolving and accumulating. When prompted on whether they think their “conflict-oriented attitude” was contagious and is transmitted to junior consultants, a senior consultant (>2 years working at EI) stated the following:

“Oh it’s obvious – junior consultants in my team are like sponges. HaHa! They are indeed contaminated by me. They know I’m not an ERP fan. So they tend to do like me, their boss. They resist to the ERP because I resist to the ERP! That’s a fact!”

On the other hand, when prompted about their perception about the ERP, a junior consultant (<2 years working at EI) showed a negative attitude toward the system and stated the following:

“I don’t actually think that my senior colleagues fill-up the ERP properly. They don’t have the time to do so. Also, I think it my colleagues are right. The system needs serious improvements”.

Accordingly, these latter observations refer to **our second research proposition:**

“Firm’s prior conflict behaviours may be contagious and transmitted to consultants, intended users of a new IT tool”.

Cycle 3

Design

Figure 1 hereafter presents the Inoculation process used in this research. The figure presents two steps showing the impact of an inoculation intervention on participants’ resistance to conflict contagion. The first element illustrates what typically happens when a management consultant assists in an internal IT training session in his firm. The second element shows that the addition of an attitude inoculation in the form of an intervention prior to a possible conflict contagion may help consultants maintain their pre-existing positive attitudes, acquired during the training session, towards the IT tool that they should be using soon, and thus their commitment to use the tool whenever required. A third research proposition was developed based on the Inoculation Theory as shown in the model below (Figure 1). Through action research, we test whether an inoculation, i.e., a weak attack based on Kyle et al.’s (1997), can protect an individual against subsequent attacks to his or her attitude. For instance in our case, we have repeatedly exposed the participants of the training sessions to Inoculation messages orally, during the latter sessions. As for the ERP-oriented training sessions, Inoculation messages included the following:

“We have exposed the strategic advantages of using the ERP to you. We also worked together to better understand the best practices for using it in a more efficient way. But hey, beware! You will certainly hear some of your colleagues nagging that the ERP is really ugly, very time and energy-consuming, or even useless. Whenever you will hear such negative statements, you will remember our pleasant training session and say that despite that the ERP is ugly, it is the reason why you got hired. It is also the reason why the Management is pursuing important decisions in terms of growth, employment and extra-money bonus distribution at the end of the year.”

Below a sample of an Inoculation message stated orally during DST-oriented training session:

“We have exposed the strategic advantages of using the DST to you. We also worked together to better understand the best practices for using it in a more efficient way. But hey, beware! You will certainly hear some of your colleagues nagging that the DST is really ugly, very time and energy-consuming, or even useless. Whenever you will hear such negative statements, you will remember our pleasant training session and say that despite that the DST is ugly, it is the reason why you more clients are hiring us. It is also a mean for you consultant, to work less, and produce more.”

In cycle three, a total of 18 open-ended interviews were made with participants from different training sessions, for an average duration of 30 minutes each. 30 informal discussions were also noted by the researchers, 15 of which were made before the Inoculation intervention and the other 15 one month after the intervention.

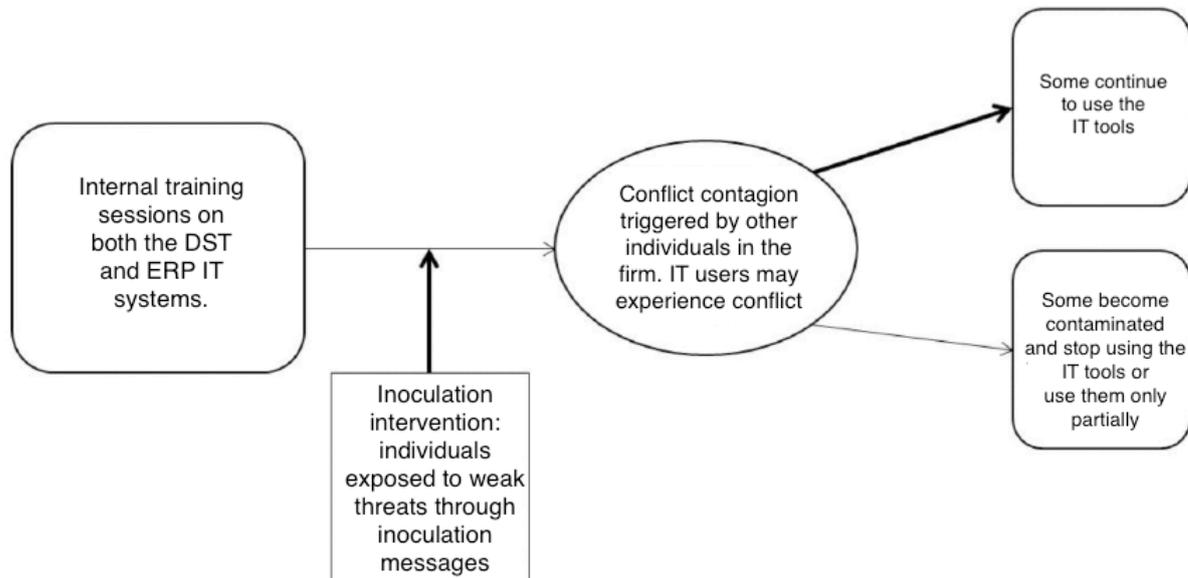


Figure 1. Inoculation process and its impact on attitude change

Results

In cycle three, during unformal discussions with the participants after the inoculation intervention, the researchers noted a general negative perception (attitude) towards the DST by consultants that have been working at the firm for at least 2 years (>2 years).

“I’ve assisted to the training session on the DST managed by Mr. Dupont. I trust it’s interesting but I think it’s a complicated thing to use. Besides, I don’t really do large assignments – thus I am not really in need of a such a tool.”, stated a senior consultant one month after the Inoculation intervention.

Junior consultants (<2 years in the firm) have however showed enthusiasm (positive attitude) and “innocence” expressing no or little conflict behaviours toward the DST.

“A month ago when I got hired, I was trained and asked to use the DST in my assignments. I actually think I got hired to use the tool and only this – I didn’t have the choice, maybe unlike other consultants. Despite that the DST has a couple of ergonomic imperfections, I think it’s quite interesting and very efficient to use”, stated a junior consultant one month after the Inoculation intervention.

Following the inoculation intervention which took place during the training sessions, the researchers’ observations were that consultants from both behavioural groups (DST-advocate and DST-opposing) but all junior consultants (<2 years) showed a more positive attitude than one month earlier, before the Inoculation intervention, when prompted about the DST. Furthermore, senior consultants (>2 years at EI) were interested to learn more about the advantages of the DST by asking questions and feedback from those who already used the tool in real assignments.

“The DST training session was pretty much interesting. I had several questions on the tool’s underlying process and was glad to be able to discuss them with Mr. Dupont. Frankly speaking, I still think it’s an ugly tool, and I don’t think I will be using it anytime soon”, stated a senior consultant one month after the Inoculation intervention.

As for the ERP, senior consultants maintained their negative attitude toward the system one month after the Inoculation intervention. When prompted about how they perceive the ERP in general, a senior consultant stated the following:

“It is really good to provide training sessions on the ERP. But... the ERP is the ugliest thing I have ever seen in my life. It’s really a pain every time I have to fill it up with data. It’s time-consuming, energy-consuming. I am however aware of its importance for the good-going of the firm, so I do it – not the way I should – but I do it!”, stated a senior consultant one month after the Inoculation intervention.

On the other hand, a large number of junior consultants showed positive attitude toward the ERP one month after the intervention.

“I have no problem with the ERP. It is not perfect, but I really have no problem with using it. I’m now used to it.” stated a junior consultant one month after the Inoculation intervention.

“I think the ERP we have at EI is not bad at all. Where I used to work before, it was hell – I had to fill-up 3 different systems every week, each system for a different task.” stated a junior consultant one month after the Inoculation intervention.

Accordingly, these latter observations refer to **our third research proposition**:

“Consultants that are exposed to inoculation treatment will increase their resistance to attitude change”.

5 Discussion

Inoculation theory has been lacking in practice in Information Systems research (Fagnot and Stanton, 2015). To date, very few research in the IS field in general and IT implementation in particular has included the Inoculation dimension as a mean to resist to resistance. In other words, Inoculation in our case has been used as a way to fight fire with fire. Instead of attempting to reduce resistance behaviours, we argue that fighting resistance with resistance (Inoculation) might turn out to be a key factor for a successful IT implementation. The conventional explanation, based on an analogy, has a major empirical support in the medical field and a lot less support in Management Science. So far, inoculation's efficacy in management science contexts, such as in Marketing, has been assessed with print- and video-based Inoculation messages. Scholars and practitioners do not yet have a clear understanding of how other modalities (e.g., peer interactions and oral inoculation) might influence participants. Furthermore, IS research has benefitted tremendously by psychological theories of acceptance, resistance or persuasion. Unfortunately researchers and practitioners have not taken full advantage of the psychological perspectives upon instilling resistance to persuasion. Attitudinal inoculation confers resistance to persuasion much like a medical inoculation confers resistance to viruses. With live attenuated medical inoculations, a weakened version of an offending agent (e.g., a virus) is injected, strengthening the body’s defences against future, stronger attacks (e.g., infections). With attitudinal inoculations, a weakened version of an offending agent (e.g., a counterattitudinal message) is subjected, strengthening the mind’s defences against future, stronger attacks (e.g., persuasive messages). In our article, Inoculation theory is amoral - it explains what happens when management consultants encounter persuasive attempts that cause attitude change. Furthermore, inoculation treatments have involved fast, dynamic, and powerful processes that have ultimately led junior consultants to resist to influence.

Action research methods postulate knowledge creation as sense-making between researchers and practitioners, concerning a specific problem situation. The researcher is not supposed to be neutral toward his observed phenomenon. Because of his scientific expertise, s/he is expected to be both as a solution provider and a theory builder. Knowledge construction is embedded with his/her active investigation in the firm. Depending on epistemological paradigms, action research involves several limitations and pitfalls (Baskerville and Wood-Harper, 1996) like the lack of neutrality and discipline of the researchers, the consulting-like approach, and the strength of the context-dependency, etc. An inherent limitation of longitudinal research is the process-continuity, evolving after the end of the research investigation (Volkoff et al., 2004). In other words, one cannot judge the problem being definitively solved, and not likely to appear again in a forthcoming period. Moreover, our research is based on a single corporation case study, and therefore we cannot claim any generalization of the results, as we could have if we had used several case studies or sample quantitative analysis. Further research should be done in order to examine findings in other professional and organisational contexts to provide a deeper understanding of inoculation techniques in the context of IT initiatives. However, we highlight in-depth research vs cross-sectional data collection, to analyse the dynamic nature of conflict contagion between IT projects. For IS practitioners, this article suggests a greater attention to issues related to firms' IT projects failure history, conflict contagion effects from a failed (or partially-failed) system to another IT tool, but also related to solving organisational conflicts and conflict contagion through psycho-sociological techniques such as inoculation. The main practical implication of this study for managers is that identifying potential conflict contagion effects turns out to be necessary to the change management style to adopt. For academics, our results enrich the literature in information systems on IT resistance. A lot of research had observed the way a new essay of an IT project can be negatively influenced by prior failing attempts. So far, this phenomenon had been mainly observed between successive similar IT projects in terms of functionalities. However, our preliminary observations reveal a contagion effect between projects far in terms of objectives, design and functionalities. Indeed, the ERP was a 'ready-to-use' enterprise system aiming IS integration, whereas the DST was an Excel-based application helping consultants make decisions. In other words, resistance contagion seems to be an opened phenomenon where projects' characteristics are not the keystone. Beyond the way IT projects are designed, developed and presented in terms of objectives, they can endorse value conflicts between cultural principles of users or groups of users and the perceived underlying strategic objectives assigned to IT deployments (Leidner et al., 2006). In other words, IT acceptance turns out to be in the light of the portfolio of past and present projects. Such a holistic way of managing IT projects can be a way to grasp the systemic dimension of the organisational information system they are part of. To conclude, the medical analogy of inoculation is commonly used to illustrate Inoculation Theory, as we have done here by applying it to the field of IT. For managers, training programs which include an inoculation treatment might improve the resistance of those with pre-existing positive/neutral attitudes about the IT tools in a firm, as well as improving resistance to negative persuasive messages that lead to attitude change. We argue that it is essential to focus on pre-emptive strategies in order to prevent "neutral" or "positive" individuals from being contaminated by a firm's negative or conflicting environment. Moreover, it would be interesting to examine further how "negative" individuals may react to inoculation. Inoculation might be proved highly beneficial to persons who are already "infected", unlike in the medical field, where a doctor typically does not immunize a patient who already has a disease, for fear that the patient's condition will worsen.

6 Conclusion

Although Inoculation has established itself as a powerful communication theory, we contend that scholars and IS practitioners have not yet explored the full potential of Inoculation-based messages, despite theoretical rationale (e.g., Compton, 2013), message development guidance (Ivanov, 2012), and empirical support in other research domains (e.g., Health) (e.g., Banas and Rains, 2010) to do so.

We encourage researchers to connect the theoretical findings of inoculation theory, in general, to the IS context, in particular, and build on this work. We hope that our ideas presented here are a step in that direction. Furthermore, the underlying message of this paper for researchers and practitioners is to consider potential IT conflict contagion effects as a key process embedded into IS management. By managing independent IT projects separately, with different teams and even with different methods, organisations can unconsciously lose sight on the way users' attitudes may be interrelated, involving cross-resistance effects. Future research headings include pursuing investigations on the resistance legacy of IT projects and to figure out how IS projects management could be enriched to prevent or anticipate the latter contagion effect through Inoculation. We consider contagion in social science in a 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.

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