The human side of an ERP’s implementation

Cahier de recherche : 04-05
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February 2004
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Cahier n° 04-05 – February 2004

ERP are very popular. However, their failure rates are also high. One of the reasons why ERP implementations fail is people. In our view, employees have to be managed adequately and with respect during ERP implementation. This longitudinal study examines individuals’ reactions to ERP transformation. It aims to better understand their reactions to that change in order to act accordingly. Specifically, we offer a new conceptual contribution with a new dynamic model of Phases of Preoccupations Theory, which clarifies cognitive and rational responses to change. Seven phases of preoccupations have been measured at four different times. The evolution of their intensity demonstrates the dynamic of the theory and the complexity of this process. Comparisons between actors show that different actors have different preoccupations at different points during implementation. Comparisons between the intensity of phases of preoccupations by gender, age, IT experience and ERP experience show no significant differences among the participants. That means that the model does not seem to be discriminatory and then, can be used in all settings with no discrimination against age, gender and These findings provide important insights into how company management may influence employees during a major transformation such as an ERP. Implications for future research are also discussed.

Key words

Studies, ERP, Change, Psychological model, Preoccupations, Resistance to change.

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The human side of an ERP’s implementation

Organizational change has been explored by thousands of studies, yet too few researchers have attempted to diagnose the actors’ experience during the transformation. In truth, a prerequisite for effective change management that is adapted and appropriate for the targets of the change is a valid diagnosis of employees’ experience. A reliable diagnosis is a method superior to estimates or approximations that too often lead to a high number of failures, situated at between 40% and 85% depending on the scope of the change. Few studies have put forth a reliable and valid measure of employees’ experience during change, and even fewer have adopted a longitudinal methodology to track the evolution of the process. Nonetheless, it is clear from the organizational change literature that a human aspect underlies the difficulties and causes of failure. It is only through a better understanding of human phenomena that organizations can implement transformations efficiently and in an enlightened fashion. Weisbord (1987) noted that Lewin had taken the leap of including individuals affected by a change in the diagnosis prior to a change, a finding that irrevocably changed diagnostic methods, namely by integrating them in the analysis of change.

Ignorance within the academic, scientific and professional spheres of a practical way to directly approach individual change and human issues, through the use of a functional reliable diagnosis, explains organizations’ failure to adequately manage the human component inherent to any organizational change process.

In our research, we have attempted to fill this gap in the study of change by proposing a dynamic reading of the individual change process. We have quantitatively measured the reactions of employees affected by a change, notably by applying the theory of phases of preoccupations. Based on the evolution of preoccupations, our diagnosis assesses the experience and dynamics of employees throughout the implementation period of a complex change. The purpose of this article is to verify the validity of the theory by means of a case study applied to the diagnosis of preoccupations. This case study should allow a better understanding of the theory of phases of preoccupation by verifying, for example, the temporal evolution of the intensity of phases of preoccupations and differences between various groups of employees affected by an ERP transformation, along with pertinent control variables such as age, gender, experience with IT and experience with an ERP on the intensity of phases of preoccupation. The choice of type of transformation, which is intended to optimize the use of information by means of a central, unique database for the entire organization, is fertile ground for the study of preoccupations, as the case studied involves a major organizational transformation, including process reengineering, which raises formidable challenges on the technical, systemic and human levels.

Multiple theories of individual change

Explaining and understanding the experiences of employees faced with complex transformations is a very promising research avenue that can shed light on the essentials of the change process. Many authors (Alain, 1996; Bareil, 1998; Bridges, 1991; Carton, 1999; Porras and Hoffer, 1986; Rutherford, Hall and Newlove, 1982) have decried the insufficient attention paid to individuals in the study of organizational change. A greater mastery and understanding of employees’ experience would allow not only consideration of the human factor in change management, but would also yield a better definition of processes indispensable to the appropriation of change. Two perspectives
have dominated the study of the experience of individuals in a time of organizational change, an area of study also known as individual change: 1) the resistance to change literature, characterized mainly by transversal methodology, and 2) the dynamic theories of change, whose methodology entails a more extensive use of longitudinal studies.

**Resistance to change**

In the past 50 years, beginning with the works of Coch and French (1947), the concept of *resistance to change* has emerged as a recurrent theme, despite its many limitations. Popular and long debated, resistance to change has been analyzed from several angles, e.g. in relation to its manifestations, principal causes, management and effects. Despite recent developments, resistance is all too often linked to symptomatic dysfunction (individual or collective and active or passive symptoms) of the individuals concerned, which is not conducive to examination of the phenomenon in a constructive perspective. It is even more difficult to identify the true causes of this resistance: does it simply result from a poor work climate or is the reaction indeed linked to the arrival of the change? Although we know that behaviors comparable to resistance often have a negative effect on individuals and organizations, the responses intended to attenuate this resistance seem to be limited to two types of reactive actions: overcoming and listening. Other gestures are equally general: educating, communicating, encouraging participation, negotiation etc. (Kotter and Schlesinger, 1979). Lastly, empirical, primarily transversal studies of the subject are rare. It is therefore not surprising that Brassard (1998) described resistance to change as an impenetrable phenomenon! What is equally troubling is the fact that resistance is a perceptual concept: seen through the eyes of others, in that it is always someone else that is accused of being resistant to change. Resistance is thus difficult to capture directly. In addition, the perspective of resistance to change views transition, statically. A growing number of authors are criticizing the concept of resistance to change. Dent and Goldberg (1999) complain of the abuse of the concept and its associated negativism, and contend that change should be studied according to losses that the individual suffers, with the minimum objective of being able to improve support. As Krantz, they finally suggest an end to the “corrosive and destructive use” of the concept of resistance to change.

**Dynamic theories**

Dynamic models of the human diagnosis in change are more pertinent because they offer a better knowledge and understanding of change. These models allow temporal analysis of what precedes and follows a current position. They present stages or phases that provide a richer understanding of human phenomena, and allow prediction and anticipation of behaviors and attitudes of the individuals affected. Unfortunately, there are currently far too few dynamic models of change directed at such individuals. Rioux, Savoie and Bareil (2003) exhaustively reviewed the models and theories that explain individual change of all sorts. After inventories nearly 40 reference works in psychology, education, sociology, management science and theology, four groups of models emerged: explanatory models of grief; exploration models; adoption models and global transition models.

The seminal grief-related model is Kübler-Ross’ (1969) description of the phases associated with grief which also contains abundant qualitative data. She inspired many authors and models that have been applied to explain other problems such as divorce, job loss or organizational change. The authors associated with this category are Alain (1996); Bowlby and Parkes (1970), Breen (1985);

Exploration models start from grief but go much beyond the first phases. They terminate with involvement into the change. Authors like Bridges, Carton, Parlman and Katas and Scott and Jaffe are grouped in this category, combining affective, cognitive and behavioral dimensions.

Explanatory models of behavior adoption originate both from social science and studies of the adoption and use of computers. Much more behaviorally oriented, these models take for granted the first more negative phases of reactions to change, and generally begin with the steps of openness, preparation, experimentation, routine or maintenance and renewal. Typical models include those of Anderson and King (1991), Loucks, Newlove and Hall (1975), Prochaska and Di Clementie (1982), Tornatzky and Fleischer (1990); and Horn (1976). These models notably describe behavior related to the adoption of change.

Models associated with the transition as a whole closely resemble the grief models, yet they enrich the analysis by transcending the acceptance of the situation, and culminate in a commitment to the new situation. Several authors have defined a transition as a series of phases or stages. Lewin, the best known of all, would be included in this category for his model: defreeze, transition, refreeze. Others are Bareil (1998); Bareil and Savoie (1998; 2002); Fuller (1969), George and Jones (2001), Hall, George and Rutherford (1977), Honos-Webb, Lani and Stiles (1999), Kyle (1993), McCarthy (1982), Rogers (1988), Rambo (1989) and Thompson (1992). The content of these models may be cognitive or behavioral.

It should be noted that a troubling observation ensues from this collective body of models: few empirical studies have been performed to validate the models. While some authors refer to research projects, there is no mention of the methodology used to construct the model. Even worse, some researchers neglect this topic entirely. Of those that present the results of their empirical studies, most opted for a qualitative methodology that relies on interviews or observations in the field, which allows them to validate the content of the models (Carton, 1999; Fuller, 1969; Hall, George and Rutherford, 1977; Isabella, 1990; Kübler-Ross, 1969; Loucks, Newlove and Hall, 1975; Porras and Hoffer, 1986; Rambo, 1989; Rogers, 1988). Very few have used quantitative methodologies that allow verification of the validity of the constructs of the models or theories (Bareil, 1998; Jacob et al., 1987; Prochaska and DiClementie, 1983). Another shortcoming is that the measures considered in these studies are rarely longitudinal. Only nine of the 40 models use a diagnostic measure. Of these, some are structured interviews, and others rely on questionnaires whose psychometric qualities have been published (Bareil, 1998; Hall, George and Rutherford, 1977; Honos-Webb, Lani and Stiles, 1999; Lewis and Seibold, 1996; Loucks, Newlove and Hall, 1975 and Prochaska and DiClemente, 1982).

Given these observations, we have set ourselves two challenges related to diagnostic analysis of individuals’ experience during implementation of complex organizational change. The first challenge relates to the diagnosis: the diagnostic measure must capture the experience of the targets of a change quantifiably, measurably, reliably and in a valid procedure; and also, it must contain benchmarks that measure the progress of the appropriation of change and statistically track the evolution of the experience. The second challenge is much more interventionist: The diagnosis rests on a particular theoretical approach, it must lead to targeted management actions, as opposed to
clinical or psychological interpretations that require individual therapy or other actions that fall outside the scope of the organizational management process.

**The theory of phases of preoccupations**

One theoretical approach is ideally suited to meeting these two challenges: the theory “Stages of Concern,” originally developed by the team of Gene Hall, at Austin University, Texas. This research team developed a tool to diagnose the intensity of teachers’ concerns regarding an innovation (for example, a new academic program).

Inspired by this groundbreaking work, Bareil (1998) completely reworked the instrument in order to diagnose the concerns of users during implementation of integrated management systems in private organizations. The measurement scale was also adapted. She subsequently validated the instrument and revisited the theory by modifying the content, name and order of the phases. Following this research, Bareil and Savoie (1998; 2002) defined a theoretical model called Phases of Preoccupations. This approach has the advantage of both diagnosing the experience of individuals, according to a rational and cognitive perspective, legitimized in organizations (superior to emotions and affect), and which also leads to targeted and customized actions at an opportune time.

Bareil’s theory maintains that to capture the experience of employees affected by a transformation, which is often imposed on them, one must grasp their preoccupations, which arise during the implantation of an organizational change. The seven phases of preoccupations describe all of the preoccupations that individuals may experience when they are in the position of actors and targets of the implementation of an organizational change. These preoccupations, common to most innovations, are generalizable to all processes of organizational change, regardless of type and of the target clientele. A preoccupation is a worry, concern or question related to an object. Seven preoccupations make up the cognitive universe of actors in a transition period. Bareil and Savoie (1998; 2002) identified seven phases that represent distinct preoccupations. Specifically, in the first phase, that of no preoccupations, individuals do not feel concerned by the change. They are indifferent and deny the existence of the change by ignoring it. During the second phase, personal impact, the individual experiences discomfort or egocentric insecurity. They worry about the impact of the change on them and on their work. The following phase is that of organizational willingness, whereby the individual no longer questions their own status, but rather that of the organization. They wonder about the impact of the change on the organization and whether the executives are taking serious steps to maintain the change over the long term. In the fourth phase, nature of change, the individuals question the subject of the change. They want details about the change and answers to particular questions: where, what, how and why. During the fifth phase, personal capacity, individuals are preoccupied with their capacities to face the requirements of the change. It is during this phase that they question the support, the time and conditions put in place to enable them to successfully manage the change. The penultimate phase, collaboration, consists in the individual’s becoming involved in the change process: they are now interested in cooperating with others. Lastly, in the continuous improvement phase, i.e. the seventh phase of preoccupation, individuals seek new challenges to face and new methods of improving the change already put in place.
Verification of the validity of this theoretical model entailed the testing of several items. The value of the diagnosis of the individuals’ experience rests largely on the metric values and the psychometric quality of the instrumentation. Therefore, verification of the evolution of the phases, and the inter-actor differences is necessary before using a diagnostic tool that is inspired by the phases of preoccupations theory.

Seven hypotheses have been postulated in this study, and will be used to test the metric qualities of the diagnostic instrument (hypothesis 1), the movement from each of the phases (hypothesis 2) and the sensitivity of the instrument to detect the differences in preoccupations between different groups of individuals (hypothesis 3). We also wanted to verify the effect of the age of the subjects (hypothesis 4), the gender of the subjects (hypothesis 5), their prior experience with computers (hypothesis 6) and their prior experience with an ERP system (hypothesis 7) on the intensity of the phases of preoccupations.

**Hypothesis 1: The phases of preoccupations are measured using a reliable diagnostic instrument**

Before analyzing the data according to the following hypotheses, we must first ensure that the metric qualities of the diagnostic instrument are sufficient. To this effect, the tool must satisfy several reliability and consistency criteria, and the statements must adequately represent each of the phases measured. Principal component analysis and reliability analyses will enable us to verify this hypothesis.

**Hypothesis 2: The intensity of each of the phases of preoccupations evolves over time in the expected direction**

The theory of Stages of concern stipulates that an individual may experience, at a given time, several different concerns related to the same organizational change, but at different levels of intensity. The hypothetical model of the movement of preoccupations over time resembles a type of wave that moves from earlier phases to later phases. Intra and inter-phase movement is thus anticipated. The earlier phases should be more intense at the start of the change, and their intensity will decrease during implementation of the change, whereas the later phases will be of lower intensity at the start of implementation and will increase in intensity as the changes are deployed throughout the organization, if the change is successful. The phases of preoccupation decrease or increase in intensity sequentially. Accordingly, during the implementation process of an ERP, the intensity of the first phases will tend to decrease over time, while the intensity of the latter phases of the model increase, similar to the movement of a wave. Individuals generally pass through the first five phases during a successful transition. Only a few employees reach phases six and seven.

Note that the wave-like movement of the phases of preoccupations is observed within each of the phases; the result is a decrease in the intensity of the first phases (1 to 4) and an increase in the intensity of the latter phases (5 to 7) of the model. Therefore, we posit that there will be a significant decrease in the intensity of the first phases (1 to 4) and a significant increase in the intensity of the latter phases of the model (5 to 7). No prior study has statistically calculated the evolution of phases except that of Bareil (1998ab), and Rioux, Bareil and Éthier (2003), who reported significant differences for four and five of the seven phases respectively. Nonetheless, the evolving intensity of the phases is identical only for two of the seven phases, namely phases four
(nature of the change) and seven (continuing improvement). This study will attempt to clarify movement within the phases.

**Hypothesis 3: There are significant differences between the preoccupations of different groups of individuals**

If the intensity of the phases of preoccupations changes over time, it also seems that all people affected by a change do not experience the same preoccupations at the same time. Consistent with research that elucidated the importance of the individual’s role in relation to a change (Bareil, 1997; Kimpston, 1987; Van der Berg, 1993) at the start of the change, we hypothesize that there will be significant differences between groups of individuals at different times. A more precise and sub-hypothesis is that the managers and internal trainers (also called super users that have received more training and information than other users) will have preoccupations of lower intensity in the first phases (1 to 4) and higher intensity in the latter phases (5 to 7) of the model than the other employees (simple users) affected by the software package. This hypothesis takes into account the fact that implementation does not advance at the same speed or intensity for all users within the organization. In fact, contrary to the belief that “implementation of change” progresses according to a single project plan, the progress of the change project tends to differ in various sectors of the organization depending on the impact of the change on the sector and the role played by the individual in relation to this change.

**Hypothesis 4: Age has no effect on the intensity of the seven phases of preoccupations**

It is generally believed that older people will tend to be more resistant to change, especially with a technological change, and will consequently experience more preoccupations (Hackett, Mirvis and Sales, 1991). Nonetheless, we refute this assumption based on previous studies and conclude that the evolution of preoccupations over time is not a function of the age of the individuals. We can then assume that this diagnostic tool of the phases of preoccupations does not discriminate according to the age of individuals, and that preoccupations are significantly more context-driven than influenced by the individuals’ age, which would have promising implications for management actions (because age cannot be acted upon directly in an organizational setting).

**Hypothesis 5: Gender has no effect on the intensity of the seven phases of preoccupations**

Prejudices dictate that women are generally more resistant to change and have more difficulty adapting to technological change than men (Hackett, Mirvis et Sales, 1991). Nonetheless, Bareil’s study (1998) called this theory into question and finds that the intensity of preoccupations is not linked to the gender of the individual, but is instead generalized to specific groups of individuals. The evolution of preoccupations is therefore not a function of gender: preoccupations are identical for men and women and the tool consequently does not discriminate against the gender of the individual.
Hypothesis 6: There are significant differences between respondents who have prior experience in information technology and those with less experience in terms of the intensity of the seven phases of preoccupations

The variable of prior experience with IT has been added to this study, in particular owing to the technological nature of the type of change studied. We advance that the more IT experience participants have, the less worried they will be, and therefore have fewer preoccupations throughout the implementation period.

Hypothesis 7: There are significant differences among respondents who have prior experience with ERP systems and those who don’t, in terms of the intensity of the seven phases of preoccupations

Prior experience with an ERP system is a new variable that was added to the study because of its particular pertinence for these systems. We anticipate that prior experience with ERP influences the intensity of the preoccupations. Therefore, participants that have prior experience with ERP systems will tend to have a less intense level of preoccupation than other individuals.

Study Design

In this section, the choice of the type of organizational change and of the organization, as well as the methodology, the sample and the measurement of variables are discussed.

Choice of methodology

To carry out this ambitious project, repeated measures were indispensable. A longitudinal research template was thus required. Our goal was to answer three questions, concerning the duration of the study, the type of change and the quality of the implementation. The type of change retained was that of a major ERP type technological transformation, which would begin in a large organization in the region of Montreal, Canada, with which strong links had already been established. A large-scale transformation of this type has major repercussions on the targets (namely the users), in terms of responsibilities, roles, tasks, competencies and organization of work, which provided a valuable opportunity to study the evolution of people’s preoccupations. Because the success rate of ERP is relatively low (less than 30% of companies successfully implement an ERP within the specified time frame, and within budget), the researchers were motivated to try to improve the implementation of these changes. The quality of the support for the transformation project and Management’s motivation to take charge of change created a fertile and appropriate context for a field study: a climate of confidence, substantial resources allocated and rigorous methodologies. Such control would ideally elicit natural and legitimate preoccupations, as opposed to concerns arising from evident deficiencies of a process for implementing a change of such complexity.

The estimated duration of the project, after a year of planning, was roughly eighteen months; this allowed for the emergence of different phases of preoccupations. The resource person at the organization helped us identify the pertinent measurement times, in keeping with the theory of phases of preoccupations. Accordingly, a questionnaire was completed four times by the participants: four months before the launching of a project (go live), a few days after training, but before launching, two months after launching and eight months after the launching. The
measurement times were selected in collaboration with the company to better capture the changes in the employees’ environment during the implementation. The first measurement took place a few months after the official announcement of the change by the company president and the project sponsor. All the employees were informed by internal mail of the advent of ERP and its impact on the company. Our project was also announced at the company by the sponsor, who requested maximal cooperation from the employees that would be asked to participate in this study (future users of the ERP system that had previously been identified). In addition, we were granted access to many groups of employees.

Sample

Nearly 250 potential users of the ERP system were identified, from which a sample of 132 people was randomly formed, although the sample was stratified and representative of all the divisions affected by the ERP project, according to a list of potential users, or study participants. These 132 people, who received a letter of invitation from the project sponsor to participate in our study, were distributed as follows: 85 future users; 19 super users (internal trainers) and 28 managers. Of this group, 95 people accepted the invitation; corresponding to a participation rate of 72%, representative of potential users. The participants originate from different departments of the organization (e.g. finance, marketing production), different hierarchical levels, and different job categories (e.g. technician, secretary, professional), and possess different levels of knowledge related to technological change. Of these 95 people, 67 replied to the second questionnaire sent by internal mail, 70 people replied to the third questionnaire and 60 employees completed the fourth questionnaire.

The participants completed the questionnaire in a closed room on the organization’s premises, following a focus group, in which they recounted their experiences with the change, for measurement times 1, 3 and 4. At these meetings, the employees were informed of the purpose of the study, which was to validate a questionnaire on individual preoccupations in a situation of organizational change. In time 2, respondents received the questionnaire by internal mail in a sealed envelope, which they had to return directly to the researcher. This new procedure was necessary because of the difficulty in assembling the respondents in a room during the intensive training period before go live. Each participant completed a questionnaire, for a duration of between 10 and 20 minutes. Respondents had to sign a notice of informed consent before completing the questionnaire, and completing the questionnaire was considered consent to participate in the study. Meetings took place during the employee’s work hours; participants were therefore remunerated by the employer while they participated in the study. If they so desired, they were free not to reply and to leave. To ensure the anonymity of their responses, respondents had to create their own personal identification number composed of the first three letters of their mother’s first name, their father’s first name and their month of birth. Researchers thus did not have access to the real identity of the participants, but could track the respondents through this code, at the four measurement times, to be able to compare their responses between the four measurement times.

Measurement of variables

Preoccupations were measured by a scientific diagnostic tool, composed of 49 items. This questionnaire is inspired by the work of Bareil (1998), and was improved and enriched (14 statements were added) to better reflect the prevailing organizational dynamics and the type of
change studied. All statements refer to the ERP system and begin with “I.” The measurement scale includes five levels: 1 = does not apply to me at this time 3 = fairly applicable to me at this time and 5 = completely applicable to me at this time. We consider this scale quite effective at differentiating the intensity of preoccupations. The respondents were instructed as follows: “Each statement refers to a preoccupation regarding the change (name of project). This statement may not be pertinent at the time of implementation, or, on the contrary, it may be a very serious preoccupation for you. Please read the explanation of the five-point scale and indicate the degree to which the statement corresponds to your current preoccupations. In other words, please rate each statement from 1 to 5 depending on how applicable it is to you at this time.”

Below is an excerpt from the questionnaire:

- I wonder whether the ERP will be maintained and supported over the long term
- I’m anxious to know how the ERP will affect my work situation
- I’m interested in discussing the different applications of the ERP
- I want to find out which resources are available to implement the ERP

The control variables were integrated as follows. The age categories were: under 29, (13% of the sample), age 30 to 39 (57%) age 40 to 49 (27%), age 50 to 59 (3%) and no respondent was over age 60. The average age of respondents was 35. The level of experience with the use of computer tools (Word, Excel, Outlook, etc.) was measured as follows: no experience (0% of the sample), one year’s experience (6%), more than one year but less than five years (15%) and over five years (79%). Respondents in this study therefore have a fairly high level of use of computer tools. They were not encountering these tools for the first time. As for their experience with an integrated management system (ERP), 21% of our sample had prior experience with such a system, either in another company or elsewhere, whereas 79% had no experience (choice of answer: Yes or No).

Results

The results of this longitudinal study of individuals’ reactions are presented according to the seven hypotheses retained.

Hypothesis 1: The phases of preoccupation are measured using a reliable diagnostic instrument

The richness of a longitudinal study largely ensues from the quality of the statistical analysis of the data. Made up of phases, this diagnostic instrument based on the theory of phases of preoccupation must satisfy several criteria. Of these criteria, the normality of the statements, correspondence of the statements to phases, and the reliability of the phases and the entire questionnaire must be measured, in accordance with statistical criteria. The analysis of the statements and the variables of the questionnaire and its structure were verified by an analysis of items: frequencies, means and variances, correlational analyses and reliability analyses. These preliminary analyses were performed on different samples, at different measurement times, to allow enlightened decisions. The elimination criteria of the statements were the means and standard deviations at all of the measurement times, the inter-correlation matrices of the items by phases and at the four
measurement times, the source of the item and the formulation of the item linked to the concept of phases. Nine statements were thus eliminated, including six statements newly formulated specifically for this study. One statement was eliminated because of the absence of variance, four statements because they were too strongly correlated with the others, and four more statements were eliminated because their formulation was too different from that of the other concepts measured. Principal component analysis was then performed; which led to the elimination of nine other statements, whose loading factors were weak (less than or equal to .40) on the predetermined factor.

In effect, as these statements did not make a contribution to the factor, they were eliminated. Following reliability analyses (alpha coefficient for internal consistency of factors), a single statement was eliminated for two reasons: the alpha was reduced because of this item and its formulation was too divergent from the other statements associated with the phase. In total, 30 items remained for the diagnosis of the phases of preoccupations. The number of statements rejected may seem high, but remains satisfactory given the paucity of studies that address this theory and the exploratory nature of several new statements, 60% of which proved to be weaker than predicted (9/14).

Principal component analysis (rotation method: Varimax with Kaiser Normalization), allowed us to abide by the postulates (KMO = .725, which is good and acceptable, the Bartlett’s test is significant and the communalities are superior to .45). This analysis explains 64% of the variance.

The reliability coefficients (internal consistency: alpha) for the whole questionnaire varied between .86 and .90 for the four measurement times. Table 1 illustrates the coefficients of internal consistency for each of the phases and for the questionnaire as a whole.

<table>
<thead>
<tr>
<th>Phases of preoccupations</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 3</th>
<th>Time 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>No preoccupation</td>
<td>.382</td>
<td>.347</td>
<td>.256</td>
<td>.336</td>
</tr>
<tr>
<td>Personal impact</td>
<td>.8034</td>
<td>.8604</td>
<td>.8641</td>
<td>.8035</td>
</tr>
<tr>
<td>Organizational willingness</td>
<td>.7896</td>
<td>.7422</td>
<td>.7346</td>
<td>.7724</td>
</tr>
<tr>
<td>Nature of the change</td>
<td>.4790</td>
<td>.5170</td>
<td>.3470</td>
<td>.6180</td>
</tr>
<tr>
<td>Personal capacity</td>
<td>.7117</td>
<td>.7965</td>
<td>.6877</td>
<td>.7117</td>
</tr>
<tr>
<td>Collaboration</td>
<td>.8400</td>
<td>.7354</td>
<td>.8142</td>
<td>.8462</td>
</tr>
<tr>
<td>Continuing improvement</td>
<td>.8218</td>
<td>.7430</td>
<td>.8616</td>
<td>.8551</td>
</tr>
<tr>
<td>QUESTIONNAIRE</td>
<td>.8698</td>
<td>.8710</td>
<td>.9013</td>
<td>.8585</td>
</tr>
</tbody>
</table>

Table 1: Coefficients of internal consistency (alpha)
Note that the two least reliable phases (no preoccupation and the Nature of the Change) were measured using only two statements, which were poorly but significantly correlated. Nonetheless, the diagnostic tool as a whole is relatively reliable, as in the five other phases.

The factorial structure is relatively simple as anticipated, with no factor exceeding .40 on two factors. It resulted in seven factors, easily associated with each phase.

Phase one, “no preoccupations,” is nonetheless problematic, in corroboration with other studies (Bareil, 1998; Bailey and Palsha, 1992) that demonstrate weak coefficients. Only two poorly correlated statements describe this unstable phase. It is understandably difficult to measure an absence of preoccupations apart from measuring the presence of preoccupations regarding another subject and the waiting period. Phase 2, “personal impact,” is measured using five statements that cover the impact of ERP on the individual, specifically concerning work, roles, work situation, work conditions and the meaning of work. Its reliability coefficients are high and satisfactory (between .80 and .86) at the four measurement times. Phase 3, “Organizational willingness,” is measured using five statements that obtain coefficients of between .73 and .79, which is satisfactory. Specifically they refer to the organization’s capacity to change, the impact of the change on the organization and the resources allocated to the implementation. Phase 4, “nature of change,” was affected somewhat by the elimination of the statements, and comprises only two statements, which strongly capture this phase, yet are poorly correlated. Their significant correlations vary between .35 and .62 depending on the measurement time. Phase 5, “personal capacity,” obtains satisfactory coefficients (between 0.69 and .80), and is measured using the four statements referring to available time to adapt, personal adaptation capacity and the degree of difficulty in learning the new tool. Phase 6, “collaboration,” is measured using seven statements and the internal consistency coefficients vary between .74 and .85). These statements refer to the possibility of exchanges, coordination, discussions among colleagues and inter-departmental discussions. Lastly, Phase 7, “Continuous improvement,” is measured using five statements that cover new methods and revision of the use of the system with a view to improvement. Its coefficients vary between .74 and .86.

We can therefore conclude that overall, a diagnostic tool composed of as little as 30 statements is reliable and that hypothesis 1 is thus confirmed for five of the seven phases of preoccupations, as well as for the entire questionnaire. However, the results of phases 1 and 4, which seem less reliable, should be interpreted with caution, as they are measured by only two statements. Overall, the internal consistency coefficients for the entire questionnaire are high: between .86 and .90 for the 30 statements it contains. We are therefore justified in continuing our analyses based on this construct.

**Hypothesis 2: The intensity of each of the phases of preoccupations evolves in the expected direction over time**

This hypothesis was intended to verify the direction of the evolution of the phases over time. Accordingly, we anticipate a significant decrease in the intensity of the first phases (1 to 4) and a significant increase in intensity of the latter phases of the model (5 to 7) as the implementation progresses. To determine the statistical difference in intensity of each of the phases of preoccupation over time, for all individuals concerned, we performed ANOVA tests with repeated measures on the means of the phases. All the results therefore pertain to a comparable sample of 47
participants. The following section presents the results of ANOVA for each of the phases considered independently, along with comparisons of means performed based on the Tukey-A technique. Table 2 presents the means of intensity of each of the phases over time.

### Table 2: Mean intensity of each of the phases over time

<table>
<thead>
<tr>
<th>Phases of preoccupations</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 3</th>
<th>Time 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No preoccupations</td>
<td>3.17</td>
<td>2.91</td>
<td>2.66</td>
<td>2.82</td>
</tr>
<tr>
<td>2. Personal impact</td>
<td>3.05</td>
<td>2.88</td>
<td>2.52</td>
<td>1.66</td>
</tr>
<tr>
<td>3. Organizational willingness</td>
<td>2.58</td>
<td>2.44</td>
<td>2.52</td>
<td>2.14</td>
</tr>
<tr>
<td>4. Nature of the change</td>
<td>2.16</td>
<td>1.73</td>
<td>1.50</td>
<td>1.44</td>
</tr>
<tr>
<td>5. Personal capacity</td>
<td>2.12</td>
<td>2.25</td>
<td>2.30</td>
<td>1.69</td>
</tr>
<tr>
<td>6. Collaboration</td>
<td>2.57</td>
<td>2.99</td>
<td>3.20</td>
<td>2.80</td>
</tr>
<tr>
<td>7. Continuous improvement</td>
<td>1.86</td>
<td>2.53</td>
<td>2.84</td>
<td>2.80</td>
</tr>
</tbody>
</table>

It was possible to identify principal effects in order to verify differences between measurements. By analyzing each phase individually, we note the intra-phase differences between measurements and the movement of the phases. As shown in table 3, 19 significant differences were calculated. Most of the significant differences were observed between time 1 (i.e. four months before the launching of the ERP) and the three other measurement times, in particular time 4, which corresponds to eight months after go live. Other differences were noted between time 2 and time 4 (phases 2 and 5) and between time 3 and time 4, for three phases, namely phases 2, 5 and 6. All of the phases revealed significant differences between the measurement times. However, it is surprising to note that the absence of differences between the measures taken at time 2 and time 3, that is after the training and the start of actual use of the ERP. We postulated that training would have a markedly significant impact on the evolution of the preoccupations.

A different approach would be to present the results phase by phase. Therefore, the preoccupations of phase 1, although they decreased in intensity, showed a principal effect (F(3,138) = 2.723; p = .047*) only between time 1 (mean = 3.17) and time 3 (mean = 2.66). Phase 2 “personal impacts” constantly decreased in intensity, and obtained significant differences in means (F(3,138) = 29.331; p < .000**), between time 4 (mean = 1.66) and the three other times, and between time 1 (mean = 3.05) and time 3 (mean = 2.52). Phase 3 “Organizational willingness” revealed a single significant difference between time 1 (mean = 2.58) and time 4 (mean = 2.14) with F(3,138) = 2.935; p =
.036*). Phase 4 “Nature of the change” also diminished constantly over time and three significant differences were observed (F(3,129) = 10.311; p < .000**) between time 1 (mean = 2,16) and all the other times (means = 1,73; 1,5; 1,44). Phase 5 “Personal capacity” increased then decreased in intensity in time 4, namely eight months after go live. Therefore, significant differences (F(3,138) = 8,571; p < .000**) occurred between time 4 (mean = 1,69) and all the other times (means = 2,12; 2,25; 2,3); indicating a significant decrease in the intensity of the preoccupations relative to the individual’s capacity to adapt, approximately eight months after go live. Therefore, we must take it as a given that the decrease in intensity of the phases applies from phase 1 to 5 inclusively, and that after that, phases 6 and 7 increase in intensity; this is confirmed by the significant differences obtained in Phase 6 “Collaboration” (F(3,138) = 7,225; p < .000**) between time 1 (mean = 2,57) and time 2 (mean = 2,99) and time 3 (mean = 3,20) and between time 3 (mean = 3,20) and time 4 (mean = 2,80), and in Phase 7 “Continuing improvement” (F(3,138) = 19.742; p < .000**) between time 1 (mean = 1,86) and the three other measurement times (means = 2,53; 2,84; 2,80).

<table>
<thead>
<tr>
<th>Time</th>
<th>Phases</th>
<th>Time 2</th>
<th>Time 3</th>
<th>Time 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1</td>
<td>4, 6, 7</td>
<td>Phases</td>
<td>Phases</td>
<td>Phases</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1, 2, 4, 6, 7</td>
<td>1, 2, 3, 4, 5, 7</td>
<td>1, 2, 3, 4, 5, 7</td>
</tr>
<tr>
<td>Time 2</td>
<td>-</td>
<td>No phase</td>
<td>Phases</td>
<td>Phases</td>
</tr>
<tr>
<td>Time 3</td>
<td>-</td>
<td>-</td>
<td>Phases</td>
<td>Phases</td>
</tr>
</tbody>
</table>

Table 3: Matrix of differences in means between measurement times for the seven phases of preoccupations

The intensity of each of the phases evolved in the expected direction for all the phases: phases 1 to 5 decreased in intensity whereas Phases 6 and 7 increased in intensity over time. A significant difference was nonetheless noted in Phase 5, “personal capacity,” which seemed to increase then significantly decreased in intensity in time 4. Hypothesis 2 is therefore confirmed: The intensity of each of the phases of preoccupations evolves over time in the expected direction, excepted for phase 5.

Hypothesis 3: There are significant differences between the preoccupations of different groups of individuals

If the intensity of the phases of preoccupations varies over time, it also appears that all targets of the change do not experience the same preoccupation at the same time. Given the research findings that underscore the importance of the role of the individual in relation to a change (Bareil, 1997; Kimpston, 1987; Van der Berg, 1993), in this study we evaluate three groups of individuals: future users (users), internal trainers (also called super users), and managers. We also formulated a more precise sub-hypothesis: managers and internal trainers (who have received more training and information) will have preoccupations of lesser intensity regarding the first phases (1 to 4) and higher intensity in the latter phases (5 to 7) of the model compared with other employees (simple users) affected by the software application. To verify this hypothesis related to the difference between the categories of recipients, for the four measurement times, we performed ANOVA tests.
for each measurement time, and if significant, why were followed by Tukey A test to situate the differences between the groups for each of the phases at a given measurement time. Normalities and homogeneity of variances were verified.

<table>
<thead>
<tr>
<th>Phases of preoccupations</th>
<th>Measurement times</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time 1</td>
</tr>
<tr>
<td>1. No preoccupations:</td>
<td></td>
</tr>
<tr>
<td>- users</td>
<td>3.25</td>
</tr>
<tr>
<td>- super users</td>
<td>3.08</td>
</tr>
<tr>
<td>- managers</td>
<td>3.45</td>
</tr>
<tr>
<td>2. Personal impact:</td>
<td></td>
</tr>
<tr>
<td>- users</td>
<td>3.02</td>
</tr>
<tr>
<td>- super users</td>
<td>2.78</td>
</tr>
<tr>
<td>- managers</td>
<td>2.96</td>
</tr>
<tr>
<td>3. Organizational willingness:</td>
<td></td>
</tr>
<tr>
<td>- users</td>
<td>2.47</td>
</tr>
<tr>
<td>- super users</td>
<td>2.45</td>
</tr>
<tr>
<td>- managers</td>
<td>2.68</td>
</tr>
<tr>
<td>4. Nature of the change:</td>
<td></td>
</tr>
<tr>
<td>- users</td>
<td>2.53</td>
</tr>
<tr>
<td>- super users</td>
<td>1.77</td>
</tr>
<tr>
<td>- managers</td>
<td>1.79</td>
</tr>
<tr>
<td>5. Personal capacity:</td>
<td></td>
</tr>
<tr>
<td>- users</td>
<td>1.95</td>
</tr>
<tr>
<td>- super users</td>
<td>2.13</td>
</tr>
<tr>
<td>- managers</td>
<td>2.07</td>
</tr>
<tr>
<td>6. Collaboration:</td>
<td></td>
</tr>
<tr>
<td>- users</td>
<td>2.20</td>
</tr>
<tr>
<td>- super users</td>
<td>3.22</td>
</tr>
<tr>
<td>- managers</td>
<td>3.06</td>
</tr>
<tr>
<td>7. Continuous improvement:</td>
<td></td>
</tr>
<tr>
<td>- users</td>
<td>1.73</td>
</tr>
<tr>
<td>- super users</td>
<td>2.62</td>
</tr>
<tr>
<td>- managers</td>
<td>2.31</td>
</tr>
</tbody>
</table>

Table 4. Differences in averages between groups of users

In time 1, i.e. four months before go live and following the announcement of the ERP change, we considered the total sample composed of 95 participants, including 63 users, 13 super users and 19 managers. The null hypothesis was rejected for three of the seven phases of preoccupations (p < 0.01**). Significant differences emerged between the groups of individuals for phase 4 (nature of
the change $F(2,92) = 5.397; p = .006**$), phase 6 (collaboration $F(2,92) = 11.213; p = .000**$) and phase 7 (continuous improvement $F(2,92) = 7.97; p = .001**$). Concerning phase 4, “nature of change,” future users have more intense preoccupations than super users and managers. The inverse of this pattern is reproduced in phase 6, “Collaboration,” where future users have less intense preoccupations regarding collaboration than super users and managers. In phase 7, “Improvement,” future users have less intense preoccupation than super users. These results **tend to confirm hypothesis 3**, which posited significant differences between groups of users. Regarding the sub-hypothesis, at the start of the change, managers and internal trainers that received more training and information have preoccupations of lesser intensity in the initial phases (1 to 4) and higher in the latter phases (5 to 7) of the model than other employees (simple users) affected by the software program. That confirms the sub-hypothesis. Nonetheless, **only three out of seven phases reveal significant differences between user groups in time 1**.

Regarding time 2, for which the measure was taken a few days after the users’ training, but before go live, we analyzed a sample made up of 46 users, 9 super users and 12 managers. Two significant differences were observed ($p < .01**$) between the three user groups in phases 1 (No preoccupation $F(2,64) = 4.44; p = .01**$) and phase 7 (Continuous improvement $F(2,64) = 4.73; p = .012**$) i.e. those situated at the extremities of the model. For phase 1, “no preoccupation,” super users have less intense preoccupations than managers; this means that managers have a higher level of absence of preoccupations. This **confirms hypothesis 3**, but refutes our sub-hypothesis because managers and super users should have fewer preoccupations than users in phase 1. In contrast, for the final phase 7, “Improvement,” future users have less intense preoccupations than super users, which confirms hypothesis 3 and hence our sub-hypothesis.

In the third measurement time, i.e. two months after go live, two significant differences appeared between the groups of individuals ($p < .08$), although they were less marked. They regard phase 2, “personal impact,” ($F(2,67) = 2.61; p = .08$) and phase 7, “Continuous Improvement” ($F(2,67) = 2.61; p = .08$). We had evaluated a sample of 46 users, 11 super users and 13 managers. Users were differentiated from the two other groups in phase 2 because they experienced more intense preoccupations concerning the personal impact of the change and less intense preoccupations than the two other groups concerning the improvement of change (phase 7), which **tends to confirm hypothesis 3 for these two phases along with our research sub-hypothesis**.

At the fourth measurement time, namely eight months after go live, two significant inter-group differences were observed in the sample comprised of 40 users, 9 super users and 11 managers. In other words, by the end of the process, phase 3, “organizational willingness,” ($F(2,58) = 5.83; p = .005**$) differs in intensity. Managers have more preoccupations concerning this willingness than the two other groups: **this tends to confirm hypothesis three but refutes our sub-hypothesis**. This complex dynamics indicate more preoccupations among managers regarding the willingness of the organization to change, and may signify a difficulty in anticipating the future of the change project. In addition, super users have more preoccupations in phase 7 ($F(2,58) = 3.42; p = .039*$) than managers. Conversely, we predicted that super users would have more intense preoccupations in phase 7 than users: **this once again tends to confirm hypothesis three but refutes our sub-hypothesis concerning differences between the groups of users (managers and super users versus users)**.
To summarize, hypothesis 3 tends to be confirmed at the four measurement times, in the sense that some significant inter-group differences were found at all measurement times. Nonetheless, only five of the seven phases of preoccupations revealed differences, namely phases 1, 2, 3, 4 and 7. Results obtained in phase 7 demonstrate significant differences at all measurement times. Although encouraging, these results nonetheless demonstrate the difficulty in systematically elucidating differences in all the phases, for all measurement times. In this sense, the results tend to only partly confirm hypothesis 3. In addition, the differences revealed vary somewhat different from those that the researchers had anticipated, in the sense that the differences are more complex than solely between future users and the two other groups, as the super users and managers are better informed. Complex dynamics seem to be at play here. The diagnostic tool is nonetheless sufficiently powerful to clarify these differences, should they surface.

**Hypothesis 4: Age has no effect on the intensity of the seven phases of preoccupations**

To verify the effect of age on the seven phases of preoccupation, we considered the different groups of ages included our sociodemographic variables found at the end of the questionnaire. After having verified the normality of the data of the phases and the measurement times, followed by the Skewness, Kurtosis and Levene tests, no transformation of data was necessary. We therefore performed ANOVA tests of differences in means between the four groups (under 29, 30 to 39, 40 to 49 and 50 to 59; no participant was older than 60). No result of the F tests was significant except a single time, in phase 4, “Nature of the change,” measured at time 3 (F (3,64) = 4.368; p = .007**), which indicates that the group of 50 to 59 had a mean (mean = 3.0) higher than those of all other groups (means of 1.67; 1.41; 1.44) during this phase. It was the only significant difference found among the 28 F tests of measures of difference of means. We can therefore confirm hypothesis four, namely that age has no effect on the intensity of the seven phases of preoccupations. We could also note that phase 4 was less reliable. This finding is particularly generalizable to a relatively young population of whom over 80% is aged between 30 to 49.

**Hypothesis 5: Gender has no effect on the intensity of the seven phases of preoccupations**

To verify the effect of gender on the seven phases of preoccupations, we considered two independent samples at each measurement time along with the Levene’s Test for Equality of Variances, or when significant, the t-test for Equality of Means. In time 1, 34 men and 59 women made up the sample, whereas in time 2 there were 19 men and 46 women, at time 3, 20 men and 48 women, and time 4, 21 men and 38 women. Of the total number of significant possible differences, the results show no effect of gender on the intensity of preoccupations. Only three significant differences were found, two in time 1, for phase 6 (F = 1.21; p = .025*) and phase 7 (F = 5.67; p = .005**), and the other in time 4 and phase 4, Nature of the change, a phase less reliable (F = 10.63; p = .025*) . At these three times, the mean preoccupations of men exceeded those of women. We therefore consider that hypothesis 5 is confirmed, and that gender generally has usually no effect on the intensity of the seven phases of preoccupation.
Hypothesis 6: There are significant differences between respondents that have prior experience in information technology and those with less experience in terms of the intensity of the seven phases of preoccupations.

The same precautions concerning the normality of the data and the various tests were taken to test this hypothesis. To verify the differences in groups according to their prior experience, we separated the groups at each measurement time according to their knowledge of IT: one year’s experience, between one and five years, and over five years. Note that our sample consisted mostly (80%) of respondents that have more than five years of experience with computer systems, and that no individual reported that they had never used computers at work. It is important to consider this variable because the study was directed at a group of individuals that were already familiar with computers, and that the change studied, i.e. the ERP system, represents a major transformation of the computer systems. The results show only three significant differences out of a possible 28 ANOVA tests of differences of means. In fact, individuals with varying amounts of IT experience appear to have the same level of intensity of preoccupations in time 1, whereas the two differences in intensity were found in time 2, for phase 3, Organizational willingness (F(2,62) = 3.492; p = 0.037*), and phase 6, Collaboration (F(2,62) = 5.717; p = .005**), with less experienced users (one year) having more intense preoccupations than those with more experience. The only other difference originates in phase 2 in time 4 (F(2, 58) = 3.173; p = 0.049*), where less experienced users have more intense preoccupations than those with more than one year of experience. These results tend to refute the hypothesis six whereby the intensity of the phases differs according to prior IT experience for users of information systems (with a minimum amount of experience). So, there is generally no difference in intensity of preoccupations between respondents of diverse IT experience.

Hypothesis 7: There are significant differences among respondents that have prior experience with ERP systems and those that do not, in terms of the intensity of the seven phases of preoccupation.

The variation in this variable concerns only two elements: with or without prior experience with an ERP system. That is why the differences in means using independent samples were calculated according to Levene’s Test for Equality of Variances, followed by the T-test for Equality of Means. Of all the combinations tested, only one was proven significant, in phase 1 of time 1 (F = 1,14; p = .01**), where people with ERP experience rated the absence of preoccupations significantly higher than the other users, signifying that they were less preoccupied than their fellow respondents. In all other cases, no significant difference appeared in any of the phases, which refutes hypothesis seven. There is no significant difference among respondents with and without prior experience with ERP systems.

Discussion and implications for change management.

To date, management of change and transformation has been mainly prescriptive. Given the encouraging results of the study and the conceptual, empirical and practical contributions resulting from the paradigmatic choices related to a refined reading of the preoccupations of the targets of change, it is now possible to better diagnose the individuals’ experience and act more effectively through targeted, adapted management actions. This paradigmatic choice should encourage managers and scholars to leave the beaten path of resistance to change and study other models for
diagnosis and action that will allow an enlightened reading of the black box, i.e. the individual cognitive process during a transition.

The confirmation of the hypotheses has numerous implications for change management, and calls more than one myth into question. First, the affirmation of hypothesis 1 means that agents of change can directly access the employees’ experiences, without going through intermediaries, who are often their managers. Therefore, the diagnostic instrument creates benchmarks, by phases, along with more precise measures than the simple approximations that are used all too often. Direct access to the individuals affected, through a legitimate, non-blaming, cognitive approach, is an undeniable advantage for research and practice. In addition, the evolution of the intensity of the phases (hypothesis 2) allows prediction of dynamics of reactions. Accordingly, agents of change and managers can expect a series of five to seven phases of preoccupations, which are legitimate and natural. We are far from the bias of individual blame advocated by studies of resistance to change. Change management can consequently be considered a process that takes time and evolves according to an individual’s pace and actions taken by the organization. Go live or the actual date of change is in fact only one point in a long process that starts well before this date and ends with the adoption of new habits, well after the launching date. This period, which Bridges (1991) calls “the transition,” is in itself a social process characterized by a series of cognitions that must be managed.

Partial confirmation of hypothesis 3, regarding inter-group differences, allows us to attack a prevailing myth in change management, namely that change management is simply project management, composed of a series of steps, timetables and budgetary constraints. In fact, effective management of a transformation entails much more social and attentive management of the needs and preoccupations of different groups of people affected by a change. Beyond a series of structured steps applied wholesale to the entire staff, e.g. the communication plan, training and the learning curve, organizations must learn to manage the impact of change on different groups of individuals. For example, in the case of ERP implementation, some groups of employees, such those in finance and production, for example, will be affected more than others. Managers must reorganize their employees’ work according to the new rules dictated by the system. Internal trainers will also find that their preoccupations are more advanced than those of their user colleagues. They must consequently learn to tailor their actions to the various preoccupations of different groups of employees. Each phase thus corresponds to a targeted action. For example, in phase 1, individuals must be destabilized in relation to the imminent change, while in phase 2, they must be reassured about their new positions, responsibilities, roles, tasks, work environment, etc. In phase 3, the organization must clarify its choices, whereas in phase 4, it must provide abundant information on the change scenario. Once in phase 5, training has maximum potential to appease the feeling of incompetence. Users in phases 6 and 7 want to share their experience and test new avenues. Because the change does not have the same impact at the same time for all individuals, the model can be applied to diagnose the phases so as to direct adapted effective actions at targeted groups of individuals at appropriate times. Down with one-size-fits-all, heavy-handed actions! The future lies in adaptation of specific preoccupations. These admittedly complex dynamics are accessible to agents of change.

Verification of hypotheses 4-7 reveals that certain control variables such as age of the subjects and gender have no effect on the intensity of preoccupations, contrary to popular belief. In fact, because the organization can do nothing about these factors, it is heartening to note that this theory is not discriminatory. As for the non-significant effects on preoccupations of prior IT experience and
experience with an ERP system, we can conclude that preoccupations are driven considerably more by the context and the individual-environment link than by individual characteristics.

In addition, we would like to recount our field experience concerning the effects of “preoccupying” about individual preoccupations. When consulted about their preoccupations, employees lauded the efforts of management of their organization to understand their needs, and they appreciated the attention paid to them. They were open to sharing their preoccupations and seemed to feel liberated after expressing their preoccupations, a process that is comparable to a type of beneficial therapy. Listened to and heard, the employees confided their worries and expected actions, in return for management and support that can help them facilitate the appropriation of the change. In that sense, a structured approach to diagnose preoccupations is not neutral; it requires rigorous follow-up, and more importantly, adapted actions originating from the organization, Management and the other managers, the project team, human resources and the change management team, in short, all stakeholders involved in the implementation of the change project.

This diagnostic approach also stipulates several success conditions: climate of trust between Management and employees, sound communication, time, coherence between words and actions, and a healthy dose of respect toward the individuals concerned.

Limits and Conclusion

Although the results are promising, a few limitations deserve mention. First, the sample is fairly restricted: experimental mortality affected the number of comparable subjects. The generalization of the results also warrants further examination. The context and the sample that participated in the study is fairly homogeneous overall, (although representative of the target population, with an average age of 35, already experienced with computers - users had worked for five years with several widely used software packages). No participant was older than age 60; all had previous experience with IT. This is in fact a fairly favorable context for the implementation of an ERP system. The absence of significant differences for these variables could have been different, if we had examined a distinct sample or measured the success or failure of past experience. However, past studies (Bareil, 1997) conducted to the same conclusions.

The quality of the diagnostic instrument should be reviewed, particularly for phases 1 and 4, which are less reliable. In addition, an important limitation concerns the fact that only one change, distributed in different divisions but within the same organization, was explored. Other studies, both qualitative and quantitative, could improve the content of the diagnostic tool, while increasing the number of statements per phase and the reliability of the tool. Additional exploratory studies are welcome, regarding both a major technological change and other types of change. A few control variables aside, this study was not intended to examine the antecedents and affect of culture or of certain conditions of the change scenario on preoccupations, variables which could be investigated in further studies.

By focusing attention on individual preoccupations, managers can capture the experience in a non-threatening, direct, innovative, constructive and respectful way. This conceptual approach is rich not only in terms of content and interpretations, but also in that it fosters specific and sequential actions. Targeted actions originate from Management and managers’ responsibility. They are thus not external to the management process inherent in the organization (as individual or group therapy
The human side of an ERP’s implementation

would be, for example). In this sense, the model meets the two types of challenges described at the start of the article: diagnostic and interventionist. It also enables agents of change to predict and measure the evolution or the absence thereof in of groups of distinct individuals affected by the change, during the transition. They can consequently adapt their actions to the real needs of the individuals, who can then appropriate the change at their own pace, and fully participate in the implementation of organizational change in a climate of trust, support and respect.

1. Note: * All differences are significant at p < .05; ** differences are significant at p < .01.
Bibliography


