Knowledge Management,
An asset for managing change?

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Abstract

Today organizations have more and more to face the challenge of managing change as their environment evolves dramatically and rapidly. This study aims at investigating to what extent knowledge management can help organizations to take up this challenge effectively. It is based on a survey of 486 establishments in the French medical and social sector around the central hypothesis that knowledge management permits a rapid adaptation to the new constraints of a constantly changing environment in order to ensure the long-time survival of the organization. The results show that this hypothesis is indeed validated, although there are other factors, not investigates here, that play a role. Consequently it is of utmost importance for organizations to deploy knowledge management policies in order to ensure their continued existence.

Keywords

knowledge management, organizational change

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Introduction

Taking care of elderly persons is an activity undergoing huge changes in most Western countries, and it will come sooner than later in "emerging economies" due to the increasing number of elderly people and their increasing dependency, the introduction of innovative but costly technologies such as tele-assistance, tele-surveillance, tele-medecine, robotics and various kinds of "connected objects", a shortage of financial and qualified human resources, increasing requirements of financers and the public in terms of quality of well-being, the apparition of private investors with profit-making objectives leading to the equitization of different corporate groups managing social and medical establishments.

These establishments operate now in a definitely VUCA (Volatile, Uncertain, Complex, Ambiguous – Jacobs, 2002) environment. In this context we intend to show that a policy of knowledge management can be an asset to manage effectively change in social and medical establishments, as can be the case with a quality improvement policy (Bertezene et al. 2010) or a CSR policy (Bertezene et al. 2014, 2015). To what extent can knowledge management be a lever for managing change? We start from the hypothesis that knowledge management permits organizations to adapt rapidly to new constraints in an ever-changing environment in order ensure the continued existence of the organization. To answer the question and validate the hypothesis, we use data coming from a vast survey through questionnaires administered in French social and medical establishments to try and understand better their practices in terms of CSR.

1. The role of knowledge management in a changing environment: modeling of the research:

This first part proposes the framework for the research. It presents a review of the literature (definition, objectives and role of knowledge management in managing change) relevant to identify the work hypotheses, construct the model for the research and choose the measurement scales.

1.1. A definition of knowledge management:

If in the whole history of the human species "knowledge makes wealth" (Landes, 1998), the advent of the "era of communication" (Castells, 1996) has changed the playing ground. The acceleration of information exchanges due to the rapid and huge development of information and communication technologies, the fact that we live an "hyper-connected" and VUCA world (*World Economic Forum*, 2012b) challenge the ways of producing, exchanging and using knowledge, at the level of individuals, as well as organizations and States (OECD, 2000, 2012; Wilson and Briscoe, 2004). Knowledge and its corollary learning are pillars of competitiveness in the international competition (*World Economic Forum*, 2012a). A specific feature of knowledge is that it is non-rival good, whose consumption does not impair the consumption of others, which feeds innovation (technical progress), develops flexibility in organizations (Volberda, 1996) and labour productivity (Powell and Snellman, 2004). In the case of social and medical organizations, knowing how to manage effectively knowledge seems to give a competitive advantage largely documented by researchers (Teece, 1998; Umemoto, 2002; Senge, 2008), but also by managers (De Geus, 1998, 2002). The 2020 Foresight study realized by *The Economist* by more than 1,500 managers in the world ranks knowledge management as the field of activities offering the best potential of productivity gains in the fifteen coming years (*Economist Intelligence Unit Report*, 2006).

As soon as the 1990s, knowledge management became a research object with the works of Nonaka and Takeuchi (1994) on the dynamics of the learning organization, which entices to

re-think deeply the strategy of organizations (Nonaka, 1994). Some authors go even further. It is generally admitted that the costs associated to the organization of the production of services (transaction costs) explain the very existence of those organizations. If those costs did not exist, it would be enough to let the market operate, Coase, 1937). Other authors consider that the existence of organizations can be rather explained by their capacity to capture knowledge and use it in a synergetic way, what the market is not capable to do (Brown and Duguid, 1998).

To give a simple definition of knowledge management, as initially understood, it is a set of practices aiming at identifying, capture, share, increase and use meaningfully knowledge present in the organization (Davenport, 1994). This definition is in-keeping with Nonaka and Takeuchi's approach (1995) centred on the idea that we need to formalize and capitalize the informal knowledge of the members of the organization as, as indicated by Polanyi (2009), we always tend to know more than we say. This refers to tacit knowledge; for example we can recognize faces, but we cannot explain how we do it. Consequently organizations do not know well the extent of the knowledge of their employees. Conversely explicit knowledge corresponds to knowledge formalized in rules, procedures, protocols, quality manuals, care files or ERP software. Taking into account these two kinds of knowledge we can consider, following Nonaka (1995) that managing knowledge consists in organizing a constant dialogue between tacit and explicit knowledge.

In this perspective, Nonaka (1995) has constructed the SECI *(socialization, externalization, combination, internalization)* model describing four processes.
- The first is *socialization*, indicating an informal sharing of experiences;
- The second is *combination*, constructing explicit knowledge from existing explicit knowledge;
- The third is *externalization*, transforming tacit knowledge into explicit knowledge through formalization;
- The fourth is *internalization*, transforming explicit knowledge into tacit knowledge appropriated by members of the organization, close to *learning by doing*.

Understanding the various dynamics of composition of knowledge permits to ensure its good transmission inside the organization.

1.2. The objectives of knowledge management:
The development of a "hyper-connected" world as mentioned above and its VUCA character amplify the necessity to process information effectively to make it useful for action (Argyris et al., 1985) and doing do transform it into knowledge. The question is then how to move from raw data to information and to knowledge. The answer lies in the reformulation of the question. Rather than asking "how can it be done", it is better to ask "who does it". Indeed the people who "do it" will shape the knowledge. The "how" depends on the "who".

Mastering the management of knowledge in order to adapt oneself to the uncertainty and complexity of the world implies to comprehend (seize together) the various elements and realize that people are not only the « first factor of competitive differentiation » (Prax, 202, p. 6 sq.) of the organization, but that they *are* the organization.

At the level of the individual, we can distinguish between three kinds of knowledge (explicit and/or tacit) implying an increasing degree of autonomy and adaptability:
- Knowing how to apply (the rule)
- Knowing how to solve a problem (which goes beyond the rule)
- Knowing why (understanding the implications of the action and be able make choices in situations where there is no simple, linear solution).

This knowledge can be explicit ("Thanks to some training, I have understood how to apply the protocol to deal with bruises") or implicit ("I know how to solve a problem because I have

the experience of it"). Adapting to new, and often unexpected, circumstances, which is and will be more and more the everyday life of organizations, is made possible either by the implementation of explicit knowledge (the change has been anticipated and procedures have been prepared), or tacit knowledge (the personnel has developed a wide scope of informal competencies through the accumulation of experience and knowledge enabling them to deal with changes, particularly unexpected ones).

1.3. The management of change through organizational learning and knowledge management

The literature on organizational learning has enjoyed a strong development in a period that has seen the world become more complex in its economic, political, social, environmental dimensions. Several authors have then tried to give a panorama of the multiple approaches of organizational learning (Chiva and Alegre, 2005; Curado, 2006). All cannot be examined here, so our choice bears on operational approaches.

A distinction is often made between the individual and the collective (or organizational) dimension of learning. As for the individual dimension, it is considered that the organization becomes more performing as its members acquire more knowledge (Stata, 1989). Learning at an individual level would then have an impact on the transformation of the organization by making it more competitive. Such learning should then be encouraged by setting up structures and means (corporate social network, repository of good practices for example) to permit a good circulation of knowledge. In the case of the organizational approach of learning, it is considered that the organization learns by imitating its competitors on the one hand, and by trial and error on the other. Both types of learning imitation and experimentation lead to the emergence of practices which, with time, become routines. In this way Levitt and March (1988) have shown that the organization sets up it functioning not from rational choices but on the basis of routines which appear legitimate as long as they are not challenged. Undoubtedly this distinction permits to reflect on the classification of the different approaches of organizational learning (Edmondson and Moingeon, 2004). It is however not easy to distinguish what comes from individuals and what comes from the organization (if we accept of course that ontologically an organization can learn) in organizational learning. It could be easier to try and see the complementarities between the individual and collective dimensions of organizational learning.

If the knowledge to acquire can be objective and observable, the role of the organization will be to make it emerge then to stock it and to spread it throughout the organization. This is Nonaka's idea with his SECI model: The continuous dialogue between tacit and explicit knowledge, the confrontation between individual practices and collective procedures contribute to the building of an organizational knowledge. Organizational learning is then seen as a process which must lead in the end to a formalization or codification of the knowledge. For Nonaka, knowledge is a "tangible entity" that can be stocked (through formalization). Learning is a collective process, the result of interactions between individuals. There is however limitations to this approach, especially in Western thought with the Cartesian idea that there is a tangible and objective world. Believing in an objective world bears the risk of falling into organizational traps like the "*Competency Trap*" evidenced by Levitt and March (1988). We are certain that we function according to the best organizational mode possible under the pretext that this mode has not been (globally) challenged. This 'blindness' can even lead to being persuaded that this mode of organization is the result of rational, objective choices, what Levitt and March call "*Superstitious Learning*". These organizational traps enhance the illusion of competency and control of the environment: epistemic arrogance! (Taleb, 2010). If the enterprise is organized "scientifically", what is the place of creativity? And how can the organization cope with a changing context? It is not because we adapted at a given moment that we will, mechanically, continue to adapt, even

less in this present VUCA world. If there is no *one best way*, all decisions are dilemmas (Johanson, 2007), *to be or not to be*, and it seems that choice can be more relevant, and accepted, if the decision is made collectively.
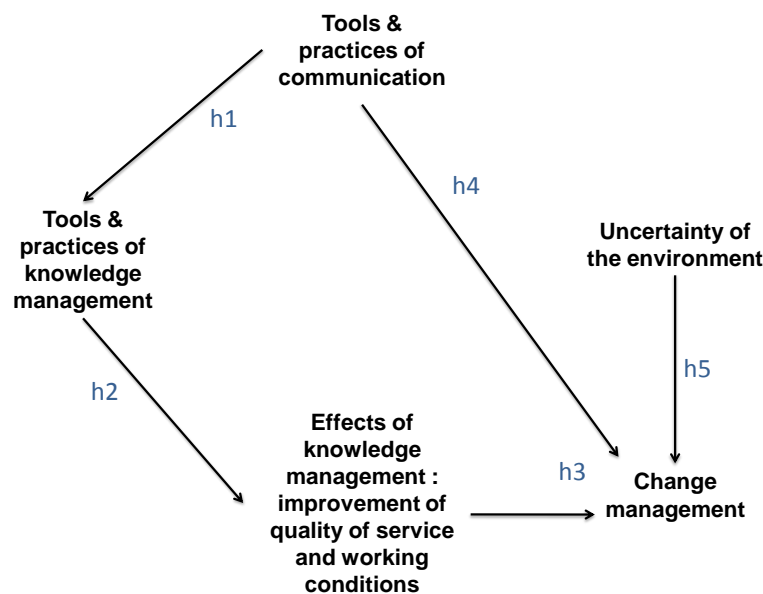
1.4. Research hypotheses and construction of the model

We wish to show that a policy of knowledge management is an asset to manage effectively change in social and medical establishments. We start from the hypothesis that knowledge management permits a rapid adaptation to the new constraints of a constantly changing environment in order to ensure the long-time survival of the organization. This central hypothesis is sub-divided into 5 sub-hypotheses:

- H1: The tools and practices of communication the organization is engaged in have a positive impact on the tools and practices of knowledge management.
- H2: The tools and practices of knowledge management have a positive impact on the organization (working conditions, quality of service).
- H3: The effects of the policies of knowledge management implemented have a positive impact on the practices of change management.
- H4: The tools and practices of communication the organization is engaged in, have a positive impact on the practices of change management.
- H5: The perceived uncertainties of the environment have a positive impact on the practices of change management.

The model is illustrated in the following exhibit:

Exhibit 1: knowledge management and change management: research model

1.5. The construction of the measurement scales:

The variables used for the sub-hypotheses have been carefully selected to guarantee their operational character.

The perceived uncertainty of the environment is a frequently studied concept in management sciences as it is related to numerous practices. For example organizations which operate in an uncertain environment need more non-financial indicators (Kaplan & Norton, 1996). In our questionnaire, we have adapted the scale of Govindarajan (1984), which breaks down this concept into seven items: demand, competitors, customers, technology, purchases, regulation and trade union actions. The use of technologies may not be considered as a determining factor in social and medical establishments as it is in industrial activities, and

demand is not a major problem as it could be in other economic sectors (large scale distribution for example). Therefore we have discarded these two items and retained a scale with five items.

The scales aiming at measuring knowledge management and change management are constructed on the basis of the works of Levitt and March (1988), Davenport (1994), Nonaka (1995), Argyris (1993), Senge (2006) and Prax (2012). The works of Prax and the OECD (2000) report have more particularly permitted to create the scales devoted to the tools and practices of communication.

These different works define the concepts studied, describe the studies as for their implementation and the results. Within this framework we have focused our attention on how the different types of knowledge (tacit and explicit) circulate in the organization and are capitalized, on the links between the construction of knowledge and the development of competencies (training) and more generally between the management of competencies and the individual performance (productivity, quality of service) and collective performance (absenteeism, work injuries, personnel turnover, quality of service).

2. Collection and analysis of data:

The survey was carried out on the internet. We will first present the reasons for using this medium, then we will present the sample selected and the rate of return, and we will order the data and qualify the sample. Then we study the structure, the reliability and the quality of adjustment of the model. Finally the results are presented, which permits to state that the research hypothesis is validated, even if further research will be needed to strengthen this result.

2.1. The web questionnaire:

Leading a survey about CSR strategies (Bertezene et al. 2015) by the establishments selected requires interrogating a large sample of directors with a rather heavy questionnaire. As directors are not easily available and establishments are geographically scattered, it is not easy to carry out face-to-face interviews and not effective to do it on the phone. Over the last years, the methods used have evolved by integrating new technologies. It was then decided to resort to a web questionnaire which permits to contact a big number of establishments. The use of this medium also reduces the cost per contact and saves time for the respondent compared to a paper questionnaire.

The questionnaire contains several dozens of questions and a number of filters to avoid redundancies. The Sphinx Online software was used to carry out the survey. It offers good ergonomics ensuring a better rate of return. It also permits to guarantee the stocking and security of the data. In order to indentify CSR practices and also motivations and obstacles for the managers in this field, the questionnaire is divided into several themes: actions put in place in the 'three pillars' of CSR (economic, social, environmental); the knowledge of the management in terms of CSR and their perception of the impact of the strategies implemented; the CSR process (stakeholders, method, reporting); the ways and means of knowledge management in the establishments and departments. The items have been tested with measurement scales validated in the literature in order get a reliable evaluation of behaviours. 5 point Likert scales have been used for the respondents to express the degree of agreement (1 = totally disagree, 5 = totally agree). The characteristics of the establishments have also been taken into account. Organizations will indeed be different depending on their age, location and qualifications of the directors. Such criteria are likely to influence the will of implementing a CSR strategy. Therefore a number of questions concern the characteristics of

the organization (status, opening date, number of places, location, etc.) and the characteristics of the director (age, sex, qualifications, seniority).

2.2. A satisfactory rate of return (12.5%)

The questionnaire was administered by mail by the directors of the establishments at the end of February 2014. These persons were first contacted to announce the launching of the survey and explain its objectives. After processing the e-mail addresses available, 4638 addresses were valid for the survey. After three recalls every fortnight, 537 persons accessed the website to try and answer the questionnaire (a rate of 13.8%). However all the persons who accessed the site did not answer all the questions because of lack of time or lack of will to answer more complex or 'strategic' questions. Finally 486 persons gave exploitable answers, i.e. a satisfactory rate of return of 12.5% considering the length and complexity of the survey.

2.3. The processing of the data and the qualification of the sample:

The analysis of the results had to overcome a number of difficulties. First the data needed to be ordered to be exploitable. After checking that all the questions had been satisfactorily answered, and thus making sure that there would not be a significant bias in the results of the statistical tests, the answers were codified. This task consists in giving a specific code to each possible answer. The coding was done when the questionnaire was worked out for closed-end questions but could only be done after the answers had been collected for the open-ended questions.

It is also necessary to qualify the sample on the basis of socio-demographic characteristics. As the characteristics of the respondents were not known *a priori,* we based ourselves on the characteristics of the organization: nature of the activity, status, location, age, number of persons taken care of, etc. Then features of the directors were taken into account such as sex, age, level of qualifications… Then the test of equality of the means or proportions was used and results where the level of significance is more than 5% were retained.

2.4. Structure and reliability of the model:

The model contains two exogenous variables (they never appear as dependent variables in the equations of the structural model; in other words no arrow points to them):
- The uncertainty of the environment,
- The communication devices in the organization

We also have three endogenous variables (i.e. dependent in at least one equation of the structural model; in other words at least one arrow points to them):
- The tools of knowledge management,
- The effects of the tools of knowledge management in the organization,
- The practices of change management in the organization or department.

It must be recalled that an empirical rule imposes to have a number of observations higher than ten times the number of structural relations and ten times the number of indicators of the most complex formative variable (Chin, 1998), which is the case in this model (325 respondents, 5 structural relations and 12 indicators maximum for the formative variables).

The results concerning the homogeneity of the measurement scales are presented in the following table. The values for the Cronbach Alpha and the Jörekog rhô are all higher than 0.7 and even often 0.8. The homogeneity of the scales is sufficient.

Exhibit 2: Homogeneity of measurement scales

Latent Variable	Dimensions	Cronbach Alpha	D.G. Rhô (ACP)
Communication	5	0,865	0,903
KM	12	0,843	0,875
Effect of KM	6	0,827	0,883
Uncertainties	5	0,698	0,811
Change management	7	0,834	0,876

Then, if the model has been correctly specified, the manifest variables must be in strong relation with the latent variable they define. When we examine the cross-loadings, we see that the most important factorial weights of each indicator (or manifest variable directly observable thanks to the survey) are really related to the corresponding latent variable, which confirms the links between the elements constituting the model.

After the Bootstrap procedure, we make sure that the indicators (or manifest variables) contribute significantly to the formative construct (or latent, not directly observed through the study) by verifying that the value of the t-test (critical ratio) for each manifest variable is higher than 1.96. In our study, only one variable does not respect this criterion. It is "do you thing that the laws and obligations of the overseeing authority are strongly foreseeable?" of the latent variable "uncertainties of the environment". We have therefore suppressed this indicator in our analysis.

Finally, we note that the correlations between the latent variables supposedly linked are real and are significant as shown in the following table (highlighted values).

Exhibit 3: Correlations between the variables of the model

	Communication	KM practices	Effect of KM	Uncertainties of environment	Change management
Communication	1,000				
KM Practices	**0,568**	1,000			
Effect of KM	0,298	**0,524**	1,000		
Uncertainties of environment	0,141	0,202	0,236	1,000	
Change management	**0,507**	0,580	**0,545**	**0,250**	1,000

2.5. Quality of adjustment of the model:

It is then necessary to evaluate more globally the quality of adjustment of the model to the data of the survey with the Goodness of Fit (GoF). In our study, the GoF (approximation of the global variance rendered by the model) is 0.409, very close to its Bootstrap estimate (0.413). So we can conclude that:
- 41% of the variance of the data is explained by the model proposed,
- The model is stable (i.e. if we carry out the analysis again on other samples of respondents, the quality of adjustment of the model will only vary a little),
- The manifest variables are strongly linked to the latent variables they define (external GoF of 98.2%). This result confirms that the manifest variables used in the questionnaire permit to define well the latent variables of the analysis. 83.8% of the internal variance of the model is rendered by the structural relations.
- The links defined between the latent variables, illustrated with arrows in the model we present, are relevant (internal GoF of 0.838). This confirms our work hypotheses.

Exhibit 4: Quality of adjustment of the model

	GoF	GoF (Bootstrap)	St. deviation	Critical Ratio (CR)
Absolute	0,409	0,413	0,021	19,888
External model	0,990	0,982	0,011	87,370
Internal model	0,859	0,838	0,020	42,470

2.6. Presentation of the results

The analysis of the structural model (importance and significance of the structural relations obtained) should permit to validate, or not, the work hypotheses. The coefficients of determination (R^2 with a value between 0 and 1) reflect the part of the variance of the endogenous variables explained by the model. We recall that these coefficients measure the adequacy between the model and the data observed and correspond to the different influences of the explicative (or exogenous) variables on the variables to be explained (or endogenous). In our model, the structural relations are significant since the values of the critical ratio are higher than two. These results consequently show the reliability and the validity of the variables used in the study.

The different structural relations of our model are represented in the next exhibit. This model entails some remarks:

- The model is relevant to measure the practices of change management in the organization ($R^2 = 44.2\%$), which permits to validate our main work hypothesis: knowledge management permits to adapt rapidly to the new constraints of an ever-changing environment in order to ensure the continuity of the organization. If three variables contribute to explain the implementation of practices of change management in medical and social establishments, all do not have the same importance in our model. Communication tools and the advantages of a policy of knowledge management have an explanatory power which is higher (respective contributions to the explained variance of the "change management" variable are 41.7% and 48.2%) than the uncertainty of the environment (which contributes for only 10.1% of the explained variance of the "change management" variable). Then it is not the perceived threats of the environment which favour the implementation of practices of change management, but rather the competencies acquired by the organization in terms of communication tools and knowledge management.
- The uncertainty of the environment is an external factor not to be neglected as it is positively related to the practices of change management initiated.
- The moderate value of the R of the latent variables "practices of knowledge management and effect of knowledge management (respectively 33.1% and 28.4%) means that other non-observed factors contribute to explain the variance of these constructs.
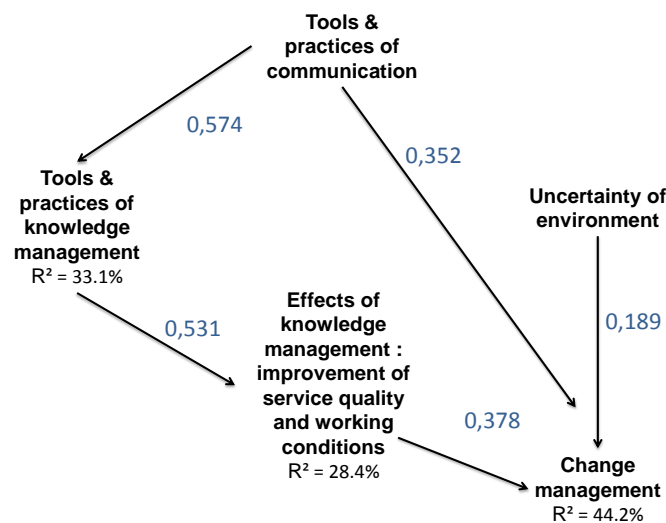
We can indeed think that the communication practices operating in the organization can by themselves explain the development of the tools of knowledge management (the characteristics of the managing director could also help in understanding this process). However, the percentage of variance explained is important as the structural equation contains only one explicative variable (the higher the number of explicative variables, the more the R tends to increase). Communication tools developed in the establishments seem to be a springboard for the implementation of practices of knowledge management.

- The reasoning is similar for the "effect of knowledge management" variable, whose variance is explained for 28.4% by the single "practices of knowledge management" variable. If it is necessary to implement certain practices to get a positive impact on the organization, other factors which are not studied in this model (characteristics of the

managing director, management modes, personnel motivation, support of the overseeing authority, etc.) can explain this result. In other words, it is not sufficient to initiate practices of knowledge management in the establishments, it is also necessary to have a favourable context to their appropriation and development.
- The implementation of communication tools in the establishments also contributes to explain the development of practices of change management, independently from the policies of knowledge management. There is then a direct and indirect effect, linked to knowledge management, of the communication tools on the practices of change management.

Exhibit 5. Estimate of the structural model

2.7. Validation of the hypothesis: knowledge management permits to adapt rapidly to the constraints of an ever-changing environment in order to ensure the continuity of the organization

The results provided by the model permit to validate the central hypothesis (knowledge management permits to adapt rapidly to the constraints of an ever-changing environment in order to ensure the continuity of the organization), as well as the hypotheses presented previously:

H1: Tools and practices of communication positively impact the practices and tools of knowledge management.

H2: Tools and practices of knowledge management have positive effects on the organization (working conditions, quality of service).

H3: The effects of knowledge management policies have a positive effect on the practices of change management.

H4: Communication tools and practices impact positively the practices of change management.

H5: The perceived uncertainties of the environment have a positive impact on the practices of change management.

Finally, this model shows that a good vertical and horizontal communication, both formal and informal, is the starting point of an implicit and explicit policy of knowledge management. This policy supposes a sharing of the information between services (care, animation, administration, etc.) and the hierarchical levels, the empowerment and training of the personnel as well as the coaching. According to the respondents, these practices improve the functioning of the organization as the motivation of the personnel increases and

everybody takes on more responsibilities. Knowledge management is indeed an asset to make ideas emerge, to innovate and favour creativity for the benefit of the customer. This creativity is also encouraged by the good circulation of the information, the coordination and consultation of teams. Being aware of the volatile, uncertain, ambiguous and complex nature of the organization, which something that can be learnt and developed, also permits to anticipate changes and favour creativity.

3. Analysis and discussion of the results

The results obtained will be discussed in three steps:
- The survival of an organization, just like that of an individual, depends on its capacity to learn (Edmonson and Moingeon, 2004) and organizational learning concerns as much the organization as the people who are part of it;
- Consequently managing knowledge in a medical and social establishment within the framework of an organizational change requires the deployment of organizational learning (to adapt to this VUCA world) upon condition that the latter is a collective construct.

3.1. Are establishments to be learning organizations?

Organizations function according to schemes of institutionalized, whether formally or not, actions inherited from past practices. In the context of medical and social establishments, these « lessons from the past » can be partnership conventions with other establishments defining the role of each establishment in some responsibilities towards certain patients (Alzheimer, handicapped people), in internal rules (for the personnel, for the public), in quality procedures, care protocols, etc. and be influenced by the technology available (in the market and the one used inside the establishment), the law (whose role is particularly important in this sector), the culture of the sector dominated by "humanist values translating into terms of physical and moral health the respect of human dignity of any individual, the non-discrimination and equality of treatment owed to each citizen" (Moliné, 2005, p. 42), the pressure of the public for a greater transparency in practices in order to fight against ill-treatment, the fiercer competition with the rapid and massive arrival of big private groups.

Levitt and March (1988) call "routines" these experiences which are capitalized and transmitted. They are self-maintained and validated through the persistence of their use. This does not lead to creativity, even not to challenge their relevance, and can lead to organizational traps (*superstitious learning* and *competency traps*). These routines slowly get engrained into the minds of the members of the organization through some formal learning (learning through procedures) or informal learning (through practice). They lead to specialization, a lack of adaptability and initiative (even more in the context a Taylorist organization which encourages such behavior). It is then at the level of the mental schemes that action should be taken to favour en organizational learning which can be a source of creativity and adaptability of professionals in the medical and social sector.

Argyris (1993) argues that the best way for an organization to control and manage the environment is to become an expert in the art of learning and adapt rapidly. It then appears as strategic for the establishments to develop a competency to learn. Learning is at the heart of the work of Argyris (1993) as he aims at giving organizations means to improve by acting on the mental schemes of its members in order to make organizations more human and more effective. The model of functioning he encourages (Model II – Argyris 1993) relies on values of responsibility and transparency.

Learning takes place in actions either by detecting and correcting an error (gap between intention and result) or by acknowledging the adequacy between the intention and the result.

People then need to experiment, to find solutions through trial and error (Lewin, 1951), to implement knowledge effectively (Argyris, 1993), to correct mistakes and learn from them. When the result matches the intention, then there is learning of an effective practice in given circumstances. But as circumstances are regularly changing, organizational learning must be a never-ending process. Actions aiming at correcting errors or testing other solutions need to be evaluated, which is also learning. And effective actions need to be codified shared (a type of learning again) so that they can be reproduced. Our results clearly show that tools and practices of communication positively impact the tools and practices of knowledge management (Hypothesis 1).

In this context Argyris (2003, p. 18) advocates more particularly a mode of communication which has proven effective: dialogue. But this of course requires that the managers of establishments are ready to devote time to this activity which is not directly productive but which will be in the medium and longer term. Argyris (2003, p. 20 et sq.) also makes a distinction between "applicable knowledge" and "actionable knowledge". Any knowledge is potentially applicable. This kind of knowledge permits to understand. Then the knowledge must be tested through action. The validity of the theory is dependent on its action on the field: managers and personnel then share a common preoccupation, which is to generate actionable knowledge useful for the persons that are taken care of.

3.2. A condition for really becoming a learning establishment: go beyond defensive routines.

Argyris is interested in the way management practices hindering organizational functioning, learning and adaptation, are worked out and maintained. "Defensive routines are thoughts and actions used to protect individuals, groups, and organizations' usual way of dealing with reality." (Argyris, 1985, p. 5). "Whenever human beings are faced with any issue that contains significant embarrassment or threat, they act in ways that bypass, as best they can, the embarrassment or threat. In order for the bypass to work, it must be covered up[…]. Organizational defensive routines are actions or policies that prevent individuals or segments of the organization from experiencing embarrassment or threat. Simultaneously, they prevent people from identifying and getting rid of the causes of the potential embarrassment or threat. Organizational defensive routines are anti-learning, overprotective, and self-sealing." (Argyris, 1990, p. 25).

Inside an establishment, based on elements which are perceived as embarrassing or threatening (e.g. the introduction of robots to deal with people affected by dementia), people will dodge problems and hide their dissatisfaction. This entails behaviours which re-enforce the embarrassing or threatening aspects creating a vicious circle of de-motivation and lack of commitment. Individual defensive routines feed collective defensive routines which in turn strengthen individual defensive routines. These routines aiming at "protecting" individuals and groups lead to a strong resistance to organizational changes. Such routines, according to Argyris, 2003, p. 68) are found in any sector of activity, whatever the size of the organization and the culture of the country. Individuals are the victims of a "clever blindness" (Argyris, 203, p. 71). They accept implicitly values guiding their actions different from the values they proclaim, leading to contradictions impairing the good functioning of the organization.

As organizational learning is the process by which the members of an organization collectively produce information to build knowledge that can orient decisions for action favouring the adaptation and development of the organization, which is confirmed by the validation of our Hypothesis 2, going beyond defensive routines implies a voluntary and collective action. Then organizational learning can be a major lever for organizational change as shown by Hypotheses 3 and 4.

3.3. Organizational learning as a collective construct.

If the stake for the organization is to be able to adapt to the context, then organizational learning is the means for this adaptation. But this learning must avoid the organizational traps mentioned above. To do so, we need to consider the nature of the knowledge on the one hand and the mode of learning on the other.

Constructivism belongs to a large epistemological field which examines the nature of knowledge (Le Moigne, 2007) and shows that all knowledge is the product of a subjective interaction between a human subject and the object studied, not only in "social sciences" but also in the "hard sciences". This approach is opposed to the positivist tradition. It breaks away from the traditional notion according to which all knowledge is a "true" representation of an independent or ontological reality. Constructivism introduces a new, more tangible, relation between knowledge and reality. Instead of saying that knowledge may represent a world beyond our experience, all knowledge will be considered as a tool within the domain of experience (Von Glasersfeld, 2004). This constructivist approach seems to be particularly adapted to a VUCA world as it advocates an organizational learning based on interactions and social relations. Knowledge is built up through collaboration.

The social dimension of learning has been underlined by the psychologist Albert Bandura (1976). Learning can be achieved through observation (the principle of the master-student relationship qualified *socialization* by Nonaka, 1994), which leads conceive this learning as the result of interactions taking place in the workplace (Brown and Duguid, 1998). Learning is then thought of as a process aiming at elaborating contextualized knowledge (in adequacy with a specific context) and operational knowledge ("actionable" according to the term used by Argytis, cf. supra). However putting people in relation with a knowledge expert (human or virtual) even using new technologies (wiki, social network, etc.) is not sufficient. Learning is not solely a means to know the world but to construct collectively, through exchanges, one's own locus. This approach implies systemic interactions between stakeholders Spender, 1996). Organizational learning is characterized as a process combining social interactions and not as the result of a shared individual learning as in Nonaka's SECI model, 19994). Sender sees the organization as a dynamic, evolving, quasi-autonomous production and use system of knowledge. In the same way Tsoukas (1996) advocates that the organization constantly (re)builds knowledge through a complex play of interactions between formal expectations and social practices.

To try and classify the different approaches to learning, we can start with two criteria:
- Does learning proceed from an individual or collective dimension?
- Is knowledge thought of as "objectivable", corresponding to an ontological reality, or built as learning develops?

We propose to add a third criterion borrowed from Edmondson and Moingeron (2004); that of organizational change. Somme authors stand as observers and offer tools to favour organizational learning; others adopt a committed standing (Argytis et al., 1985) and aim at experimenting organizational solutions in order to improve   the effectiveness of organizations. This pragmatic approach permits to override the binary learning logic of individual learning / collective learning and to understand in a systemic perspective the interrelations (including oppositions and contradictions) between the individuals, the organization and the environment.

An organization will become a learning one when the mental schemata of the individuals in it have integrated the systemic dimension of the organization. When our results show that the policies of knowledge management have a positive impact on the practices of change management (h3) as well as the perceived uncertainties of the environment (h5), we can consider (following Edmondson and Moigeron, 2004, p. 26 et sq.) that health professionals

are accountable for the way the organization functions and the changes to carry out to improve its functioning.

In this light, it is possible to define organizational learning as the process thanks to which the members of an organization look for and produce data and information collectively in order to build up knowledge that can orient decisions for actions favouring the adaptation and development of the organization.

4. Conclusion

The objective of this research was to understand to what extend knowledge management could be lever to facilitate change management. We chose the context of medical and social establishments, believing them to be a good example as they are undergoing significant and rapid changes, to try and answer this question. A survey through questionnaires was carried out by 4638 French establishment, of which 486 (12.5%) provided exploitable answers. The results of the research show that knowledge management permits to adapt rapidly to the new constraints of a constantly changing environment. But the cause-effect link is not direct: the tools and practices of communication have a positive impact on the tools and practices of knowledge management. The latter then have positive effects on the organization (working conditions, quality of service). In their turn these positive effects act favourably on the practices of change management, which are encouraged by the tools and practices of communication of the establishment and its capacity to identify correctly the uncertainties of its environment, thus creating a virtuous circle for effective change management.

The model used validates the central hypothesis: knowledge management permits to adapt rapidly to the new constraints of an ever-changing environment to ensure the continuity of the organization. However the relatively low value of the R^2 of the latent variables ("practices of knowledge management" and "effects of knowledge management") means that other non-observed factors contribute to explain the variance and can explain the result. This can be an interesting point for future research. In any case, the results show in a satisfactorily clear way that the survival of an organization in a VUCA world depends on the capacity to learn of the establishment and the professionals that compose it. Consequently managing knowledge in a medical and social establishment, and most probably in other economic sectors, for organizational change requires the deployment of organizational learning conceived as a collective construct.

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