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Possible Contributions of Qualimetrics Intervention-Research Methodology to Action Research

Henri Savall, Véronique Zardet, Michel Péron, Marc Bonnet

The objective of this paper is to present the possible contribution of an innovative method referred to as qualimetrics intervention-research because it helps measuring the impact of action-research processes, not only from a qualitative point of view, but also from quantitative and financial ones. It brings to light the necessary requirements or conditions to obtain the creation of generic contingency in the field of action-research through a "Contradictory inter-subjectivity" principle. These concepts are illustrated with reference to an experiment conducted in a construction site on behalf of the ministry of public works. The objective was to design innovative methods to reconcile quality-safety and environmental standards with budget constraints.

Key words: evaluation of action-research processes, qualimetrics intervention-research, generic contingency, contradictory inter-subjectivity, socio-economic theory

Introduction

This paper is aimed at drawing the attention of Action-Researchers on the need to conceptualise the results of action research processes. Indeed, one can observe the extreme variety of the methodologies which claim their kinship with the action-research approach stream. We cannot but side with Olav Eikeland when he posits in his seminal book chapter in Reason and Bradbury's Handbook on AR (2001) that "the *really*, but tacitly privileged

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method of mainstream methodology and thereby also of traditional social research, is arguably some kind of Action Research".

However, action research is often seen as a research method only aimed at producing contextual knowledge, as opposed to reproducible models of knowledge. Therefore, we intend to analyse a new research method referred to as qualimetrics intervention-research to show why it can possibly enhance modelling of action research outcomes, in a multi-dimensional way.

The qualimetrics intervention-research consists in a dual process aimed at reconciling academic research and field research. The concept of qualimetrics intervention-research, which is close to action-research "implies the frequent presence of the researcher within the enterprise in order to ensure systematic observation of management situations under study. This methodological option acknowledges that the researcher is clearly engaged in his or her research strategy and co-constructs knowledge with the actors observed" (Buono & Savall, 2007, p. 428). We would like to focus on the potential contribution of this research method to Action-Research, with a view to showing that action-research should be carried further to its logical climax which consists in reconciling the social, economic and financial objectives of the organisations. It implies one should go for an even more comprehensive approach to action-research to help create a cohesive body of findings covering the full gamut of qualitative, quantitative and financial information.

In this paper, we show that the essence of qualimetrics intervention-research is that the scientific knowledge acquired is concomitantly based on qualitative, quantitative and financial data. This qualimetrics research methodology is by no means to be equated with "reflexive consultancy". Indeed, the qualimetrics approach goes beyond implementing "one size fits all systems" and participative observation or even collaborative research, because the implication of the researcher with the actors consists in observing a conscious and *participatory* change process. When using the word " participatory", we agree with Reason & Bradbury (2001) and Arieli, Friedman & Agbaria (2009) in that we consider that participation is a major characteristic of any action-research method, but as far as the qualimetrics intervention-research process is considered, we think that the relationship between intervention-researcher and company actors is not "blurred", because at the

inception of the research-intervention a long process of negotiation is to be found: the objective is to ensure that the process will not be distorted during its implementation, and that each and every category of actor takes an active part. However, the "paradox of participation" is that there may be no real commitment nor trust from the part of some actors ("pseudo-participation"), but the initial contract anticipates the problem, as it specifies all the requirements for the active participation of all the actors. The researchers are called "intervener-researchers" because their intervention in organisations is aimed not only at co-creating contextual knowledge, but also generic and scientific knowledge. An intervener-researcher is thus construed as a "person utilising the result of his or her interventions to nourish research and scientific knowledge, to help carry out further interventions" (Buono & Savall. 2007, p. 428). To put it in a nutshell, we can posit that in the intervention-research approach, the acquisition of new knowledge constitutes in essence the finality, and that the intervention itself stands for the method.

1. Problematics

The qualimetrics research method was created early in the 1970s by Henri Savall and the ISEOR team with the objective of contributing to the continuous expansion of action research methodologies. In his book "Work and People", Henri Savall observed that the socio-technical approach could be furthered by addressing not only the participatory and organisational aspects of action-research, but also by stressing the importance of strategic and financial stakes within companies and organisations. As mentioned by Danilo R. Streck in his editorial of the International Journal of Action Research (2010), this research method differs from consulting. For instance, if we think in terms of dialogue, we have in mind the conflict-co-operation inseparable duo (Perroux, 1975). We of course side with the observation that all schools of thought in action-research family share the assumption that "every participant is a producer of knowledge...and is oriented towards emancipation and social transformation".

Epistemological paradigm and status of model produced

At first sight, qualimetrics intervention-research could be termed constructivist: the status of knowledge produced in action-research is substantial, procedural, and context specific. Qualimetrics intervention-research is also substantial and procedural, but at the same time contingent and generic. Indeed, it rests on three pillars (Savall & Zardet, 2004, 2011):

– First, the *Cognitive Interactivity Principle* which is an interactive process (between company actors and intervener-researchers) of knowledge production through successive feed-back loops with the steadfast goal of increasing the value of significant information processed by scientific work, i.e. several interviews and meetings are organised to help actors be more accurate with regard to the dysfunctions to be addressed. The cognitive interactivity principle comes into play when a verbal exchange of opinions between the researcher and one or several actors generates some form of knowledge. As David Boje puts it in his preface to the "the Qualimetrics Approach" (p. xvi, 2004) " it is assumed that the researcher has technical knowledge in measurement, the practitioner has technical knowledge and experience in understanding how numbers are being generated and used".

– Second, the *Contradictory Intersubjectivity Principle* which consists in confronting the points of view of every actor, the objective being to identify specificities and convergences and to reconcile different or conflicting logics within the enterprise.

– Third, the *Generic Contingency Principle* designates the epistemological principle introduced by the socio-economic theory that, while recognising the operational specificities of organisations, postulates the existence of invariants that constitute generic rules.

Scientific rigour does not preclude applicability and reproducibility, all the more so as practical tools (see below) come as a back-up to promote development and facilitate decision making. Futhermore, enacting those tools makes it possible to transform cognitive maps (Weick, 1995) into "roadmaps".

Background

The ISEOR research centre was thus set up with a view to experimenting with a new research methodology aimed at encompassing social and economic issues. The assumption behind the research scheme was that organisations suffer from a lack of transformation and metamorphosis potential, which results in a huge amount of short term and long term *hidden costs*. To speed up or energise this transformation process, it was necessary to design a specific action-research and Organisational Development process which would not only take into account qualitative and quantitative variables, but also financial indicators (Sorensen, Yaeger, Savall, Zardet, Bonnet, & Péron, 2010). This is why the term Qualimetrics has been coined by Henri Savall to underscore the integration of qualitative, quantitative and financial indicators and data. In a way, it addresses the same issue of external/internal understandings as evoked by Gustavsen (2008) when trying to promote new forms of work organisation. The knowledge thus accumulated made it possible to contrive a new approach to the dynamics of organisation theory referred to as "Socio-Economic Theory of Organisations" and "Socio-Economic Management".

Qualimetrics research shares common points with existing streams within the family of action-research (Reason, et al., 2001) while differentiating itself by attempting to go beyond the conflict between action-research and quantitative oriented research methods (Savall, et al., 2004). In action-research, "researchers act as committed facilitators, participants and learners (Boje & Rosile, 2003) rather than distanced neutral observers, analysts or manipulators," (Arieli, et al., 2009, p. 265; Brown, et al., 2003; Reason & Bradbury, 2001). Qualimetrics intervention-research, as for it, is defined as an interactive method between a researcher and his/her research field, which differentiates from a positivistic distancing stance where researchers are outside the field and refuse to participate to the transformation process. Conversely, the qualimetrics intervention-research enables to give another representation of the object observed (organisational phenomena) through the capturing of knowledge not released so far by company-actors. The intervention-research methodology necessarily implies *interaction* and *interplay* as fundamental elements in our research process. It is to be construed as a dynamic process that is constructed in iterative fashion through mutual influences exerted by

company actors on one another. When we use the word "interplay", we refer to the company as a communicative space, where the company actors enact different roles which have to be taken into account when going in depth into the research process.

Action-research methods resort to the same discourse and document analysis as well as direct observation of management situations. Qualimetrics shares the main principles of action-research, as elicited by Werner Fricke (2011):

- Conditions of the project are discussed with top management.
- The project is aimed at improving the working conditions.
- Co-operation between experts and actors result in joint learning.
- The project is about change and gives voice to the "culture of silence".
- All workers are put in the position to express their comments on the dysfunctions observed in their own situation.
- The project is a joint learning process, a joint reflection and a joint action.
- The project includes work organisation re-design, in particular through job enrichment and the method draws on critical approaches to Taylorism and traditional division of labour.

However, qualimetrics research is specific in some aspects:

- It is both a bottom-up, a top down and a cross-divisional participative process.
- It insists (Savall & Zardet, 1987) on the economic side of the project, as it is aimed at demonstrating that lack of participation and negotiation results in hidden costs, including overcharges and opportunity costs. As a result, it is a critical approach to management control and finance, which is aimed at reporting only to the stock-holders.

One essential aspect of Qualimetrics data collection process is that it keeps to a three-fold triangulation approach:

- An interaction between qualitative, quantitative and financial data.
- Checking against each other the results of interviews, document study and direct observation.

– Sorting out convergence and specific aspects of statements expressed by top-management, executives and employees. The qualimetrics research more particularly insists on the description of transformation phenomena.

Another observation at this point is that qualimetrics research in its approach considers the organisations as complex objects: the common objective is not to reduce organisations to snapshot photographs of the building, the machines and the workforce, but rather to consider them as comprehensive and integrative mechanisms. The Qualimetrics approach to the organisation tends to the re-articulation of the various parts and components and their integration. But, according to us, the qualimetrics approach is aimed at developing a systemic conceptual framework which includes quantitative and financial dimensions: indeed a Qualimetrics analysis carried out with organisation actors shows both positive and negative interaction between structures and behaviours as illustrated in the case presented below. The results of Qualimetrics research has shown that improving only a part of these structures and behaviours is not sufficient to put an organisation back on an even keel and lead to sustainable performance.

It is absolutely necessary to resort to the epistemological approach at this point to differentiate action-research and qualimetrics intervention-research from consulting as inter-action and inter-play are important words in the qualimetrics epistemology. It insists on the etymological meaning of the "inter" prefix: among or between, also present in the word "intervention". This interaction is also brought to light in the qualimetrics epistemology through the concepts of " pool of informants", "portrait gallery " and "interactive actor polygon" that researchers use to better analyse the various stakes of each and every actor along the research process. In particular, a negotiation process takes place before any kind of intervention so as to set the rules of the game of the intervention-research, in particular as regards the participatory dimension of each phase of the research process. Like in the ethnostatistics approach, it insists on the quality of data collection (Gephart & Smith, 2009). If top managers do not agree to comply with these scientific rules required by this type of action-research method, the project is a non starter. Indeed, conditions for bottom-up relationships aspects of the research-intervention, such as mirror-effect and socio-economic project have to be met

in order to avoid a consulting-like process. In many cases, the length of this "due diligence" negotiation process exceeds one year and the project may even fall apart when both researchers and company actors don't come up to an agreement: for scientific reasons, researchers have to avoid to embark on a process which cannot stand a chance of coming to successful end, because of unwillingness from the part of company actors. The interactive dimension of the qualimetrics research methodology stems from the fact that the research project is based on an initial contract between the research centre and the top management of the enterprise.

The Qualimetrics research is based on the scientific observation of organisation metamorphosis phenomena as they unfold concurrently and consecutively through the interaction between a research team and company actors throughout the organisation. Observation is based on an interactive and transformative process and leads to an integrated mix of qualitative, quantitative and financial data. The outcome of Qualimetrics research is both context-specific and productive of generic knowledge.

As compared to other action-research approaches, Qualimetrics research teams take an active part in the launching of the change process and the transformation of organisational patterns. Besides, the Qualimetrics approach is also aimed at measuring the impacts of transformation processes through the integrative mix of qualitative, quantitative and financial data, which enables the comparisons between several intervention-researches so as to find out those factors that form invariants.

In this article, we propose to elicit some underpinnings of Qualimetrics research through the case study of a research-intervention carried out in a construction site.

2. Illustration of qualimetrics research

Presentation of the case-study

This case-study is centred on a Qualimetrics research carried out in a construction site aimed at building a low rent apartment building in keeping with high quality environmental standards. Even though limits can be observed,

we'll try to generate some knowledge from this single case research (Palshaugen, 2009)

One year before the kick off of the construction process, the contractor and the research centre, together with the Ministry of Public Works took the decision to co-operate and co-finance the research scheme as they all were interested in creating knowledge on improved working and safety conditions on construction sites, while cutting construction costs. Indeed, the research centre had been approached by government officials seeking a method that would enhance compatibility between lower construction costs, higher quality of the building and improved job safety and working conditions in the construction industry. The contracting company was also willing to experiment such a socio-economic methodology on a construction site at trans-organisational level, as this company had already experienced the benefits of a qualimetrics research process, involving its 300 employees from top-management to rank and file, who had all agreed on the positive impacts of such a process for each and all company actors. All 14 contractors agreed to embark on the project, as they already had experienced the pain stemming from poor conciliation and accepted to experiment innovative co-operation methods, and all the implications involved in the participatory and collaborative methodology. The Qualimetrics research was then carried out from the inception of the project down to its completion, which extended over a two year period

Methodology

The Qualimetrics research method is a socio-economic organisational innovation intervention-research which addresses all the hierarchical levels from employees to top managers. Researchers spur a process of dialogue, "and the researcher's role is to generate a negotiation of the meaning of the problems" encountered (Thiollent, 2011): The method is referred to as HORI-VERT and consists of two main actions aimed at fostering "decentralised synchronisation". By decentralized synchronisation, we mean the participatory projects in various areas of the organisations do not necessarily result in improvement

for all, as one can often observe negative side-effects or downsides of projects due to lack of coherence and discrepancies between projects :

– VERTical action involving at least two departments and the line personnel and leading to vertical diagnosis and project. In the experiment presented in this paper, all 14 contractors have been involved in the research process.

– HORIzontal action, which consists of a diagnosis of dysfunctions with the board of directors and the management team opening on a horizontal project focused on the overall dysfunctions of the company.

One can often observe that projects only focused on a part of the organisation are vertical by nature and do not actually take into consideration the strategic issues of the company, nor the way of working of the board of directors and its link with the organisation governance and short and long term economic performance. In the case of this research experiment, the contracting company and other corporate governance stake-holders have taken an active part throughout the process. This Horizontal action necessitates the participation of the following actors:

– *Horizontal action*: the owner, including the commercial department, the maintenance department and the department in charge of monitoring the flow of tenants, the project manager; the contractor, the architect and delegates of certification offices.

– *Vertical action*: the research-intervention involved the different subcontractors and craftsmen as follows: earth-moving, building shell and masonry, plumbing, heating and ventilation, electric wiring, woodwork-panelling and joinery, carpentry, water-tightness, floor covering, painting and wall-papering, locksmith's trade, partitioning, door and window frames.

Therefore, this architecture, different from a relationship building process in so far as structures and behaviours are inseparably inter-woven in the qualimetrics intervention-research approach, consisted in integrating the top management team, the different departments and the line personnel in order to make them actively participate: it was based on an attempt to establish some symmetrical relation between researchers and company actors. E.g., in

the construction site, it was necessary that all contractors and their personnel, along with the project manager, the contracting authority and the suppliers contributed in a collaborative way in the design of innovative solutions. It could be actually seen as an architecture establishing a communicative space for all the actors involved in a well planned change process. This Horivert process made it possible to irrigate the entire construction site at trans-organisational level and effectively implement an overall organisational development integrating the economic and strategic aspect of organisational participative steering.

Metaphorically, it calls to mind the construction techniques of New York skyscrapers built on swamps which required building at the same time foundations and superstructures. e.g., in the case of the Horivert method, it is key to start the intervention by negotiating the participation of all the actors: the qualimetrics research is a kind of contract between researchers and all the actors who are involved but this doesn't mean they have to see eye to eye with each other, all the more so as contradictions often lead to breakthroughs.

Qualimetrics process

The process consists of the three main change management axes graphically represented by *thriedron* shown in figure 1 (see below): the process of improvement, the innovative socio-economic management tools and the political and strategic decisions.

a) Process of improvement

Several steps were implemented before the construction site was opened, from the very blue-print onwards and carried on until the project was completed and tenants moved in.

Diagnosis

Like in all action-research projects and inquiries, it is obvious that establishing a diagnosis is a participative process resulting from a thorough analysis of facts and problems enabling to gain understanding for future decisions. In our definition, diagnosis doesn't refer to a doctor-patient relationship, as usually understood in a setting where doctors know the solution and patients are

ignored, but as a collaborative process between the organisation actors and the researchers (Savall & Fière, 2007). Diagnosis starts with semi-directive interviews followed by a *mirror-effect*, which constitutes an important step in the research process. It is the critical moment when the diagnosis is returned, when the actors get a genuine representation of their company and its dysfunctions and when they become aware of the necessity to take action. Indeed, it enables to take stock of the unsatisfying state of the organisation functioning as compared with the targeted strategic objectives. In the case of the construction site, we could observe delays due in particular to corporation upstream dissensions or conflicts entailing a domino effect on the following contractors, mistakes resulting sometimes in the necessity of re-work, e.g. partitions which have been pulled down to be rebuilt at some other place, work accidents mainly due to nervous pressure in order to catch up with delivery delays, not to mention thefts on the construction site. Hundreds of remarks of this type have been collected through semi-directive interviews conducted with the shop-floor and executives of the 14 organizations involved. The financial consequences referred to as "*Hidden Costs*" in the SEAM intervention were assessed at more than 10% of the overall construction cost. A feed-back "*mirror-effect*" meeting was organised with the participation of the contractors. *Field-note quotes*, a verbatim presentation of the ideas expressed by the people interviewed, as well as the dysfunction costs were reported in front of the audience. This development made them aware of the necessity to reconsider their representation of the operation of their company as well as that of the construction site itself, even though they considered this current building site as an example of the profession best practices. The reasons evoked for the dysfunctions can be broken down into six categories and exemplified as follows:

– *Working conditions*: e.g. heavy spare parts had to be handled up by plumbers to the third floor because the crane had already been removed.

– *Work organisation*: lack of detailed instructions led to misinterpretation of the blueprints provided by the architect.

- *Communication-Coordination-Cooperation:* absences of various participants in meetings on site were detrimental to the good implementation of decisions in spite of remedial attempts by the project manager.
- *Time management*: lack of anticipation with regard to the most appropriate tools required for the work in progress. It resulted in the necessity to fetch those tools outside the building site and losing each time at least 3 hours in transport.
- *Integrated Training*: due to a high rate of staff turnover in some corporations, recently recruited employees were not skilled enough to carry out the most difficult tasks, resulting in shifts in functions of their hierarchy and leading to disorganisation.
- *Implementation of the Strategy*: all contractors and their employees were not on the same page as regards the quality standards negotiated for this building as they were accustomed to downplay the finishing. It resulted in tensions between contractors and the client and in the necessity to return on site even after completion of the building.

A second meeting following the presentation of the *mirror effect* was devoted to the analysis of the root-causes defined in the Socio-Economic qualimetrics intervention-research method as the *expert opinion*. Together with the analysis of unvoiced comments, it enabled bringing to light the reasons for the dysfunctions buried within the infrastructure of the organisation. Excerpts may be presented as follows:

- The contracting authority was not enough present on the site and was obliged to take minor decisions in haste, which contributed to deteriorate the confidence climate among actors.
- Contractors rejected responsibilities for the dysfunctions on one another because the rules of the game had not been clearly negotiated upfront.
- The habit of selecting the lowest-bidder sometimes resulted in the taking on of an insufficiently qualified contractor, only concerned by reducing its costs to the detriment of the overall quality of his work.

This *expert opinion* allowed participants to realise that quick fixes weren't enough to attain sustainable performance and that there was an urgent need for overhauling the organisation.

One can illustrate this phenomenon in the case of the construction site:

– Concentrating efforts to solve only some of the five *structural* problems identified in the socio-economic theory (Savall, 1974) would lead to a kind of imbalance leading to the distorted representation the intervention-research process strives to avoid :

  Physical structures: The meetings were held in a very tiny pre-fab, which made communication arduous. However, expanding the floor-space would be of no avail if the behaviour of the contractors did not stop being unpredictable not to say erratic.

  Technological structures: New building techniques and processes with regard to partitioning could not be turned to proper use because managers did not devote enough time to training workers thus missing a creation of potential opportunity and entailing defects due to bad workmanship and additional costs to repair them.

  Organisational structures: It is not sufficient to enlarge the part played by one of the leading contractors (i.e., the masonry company), if trust is not established between the various contractors.

  Demographic structures: Looking for a rejuvenated labour force is useless if young apprentices resign after a few months because they do not appreciate the management style and working conditions and resent being shouted at.

  Mental structures: To cope with the reluctance of the workers to wear their safety equipment, training sessions had been set up, but the management turned a blind eye to the infringements of regulations.

– Focusing efforts to insist on the 5 categories of *behaviours* mentioned in the socio-economic theory, like in some OD and leadership management interventions would not necessarily be up to expectations:

Individual behaviours: out of a team of eight workers in the painting company, two didn't show much diligence. The supervisor could try to better involve employees, but would inevitably be faced with sick-leave applications in the following days because of mismatch between professional requirements and home-life.

Individual behaviours: some young employees resigned only a few days after their recruitment because they considered the job as too demanding, and even did not mention to their manager they would not show up the following day.

Behaviours at group activity level: the plasterers used to start work half an hour late. When reproaches were aimed at them, they would say that this was due to unavailability of the necessary equipment on account of delivery delay.

Sectoral behaviours: the plumbing company used to leave the site dirty and tilers had to clean the floor. As an excuse, the plumbers said that cleaning was not stipulated in their contract.

Collective behaviours: The various contractors agreed to say that they were not responsible for defects that could be detected later because they did comply with the scheduling.

Therefore, the Qalimetrics intervention consists in simultaneously engaging actions within an organisation on all its structures and human behaviours, by addressing the root causes of dysfunctions which are to be found in the way structures and behaviours interact. It results in a coherent architecture of actions aimed at facilitating the emergence of sustainable effective and innovative solutions.

Figure 1: The three axes of the qualimetrics research process
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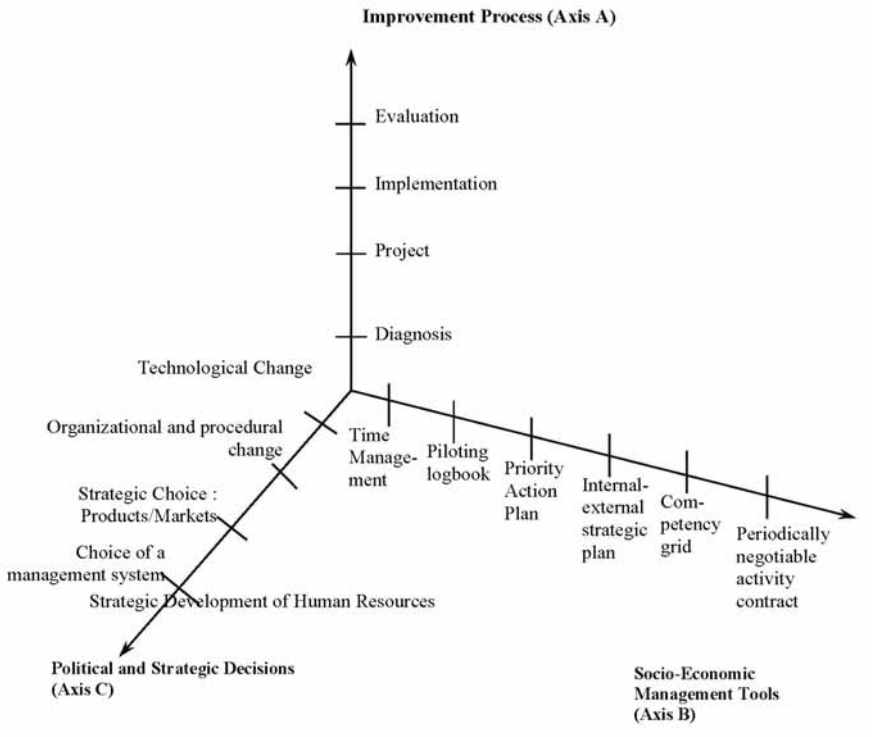

b) Project, implementation and evaluation

In the case of the Qualimetrics research on the construction site, the follow up to the diagnosis phase was a participatory project not only focused on each contractor (vertical action), but also at trans-organisational level (horizontal action)

Following the mirror effect a horizontal focus group was set up in order to design preventive actions. This focus group was formed with all the contractors, who committed themselves to attend the sessions at least two months before their involvement on the constructing site and one month after completion of their work. This additional work-load had been required in the

bidding procedures, and they had been willingly accepted by contractors as they were aware of the potential time saving if preventive actions were taken. Examples can be presented:

Improvement of communication, coordination and co-operation among contractors:

It consisted first in strengthening co-ordination with regard to blue-prints. Even though overall plans were available, it misinterpretation of various details by the contractors could not be avoided. Focus groups had to be set up to discuss and settle the conflicts and misunderstandings. This solution enabled to reduce waste of time due to mistakes made e.g. by the mason who no longer forgot to leave a space in the wall for some specific pipes.

Improvement of work organisation: the objective was the increased stability of workers and contractors. The method consisted in having recourse to various contractors accustomed to working together as opposed to a choice solely made according to the lowest price obtainable. It resulted in solving dysfunctions such as the following:

- Cautious completion of concrete slabs in order to avoid damage to pipes, wires and tiles.
- Less damage on the wood-work because the different employees working on the construction site were more respectful towards their fellow-workers.
- Fewer thefts of small equipment and materials due to enhanced vigilance on behalf of each and every worker on the site.

Overall the package of solutions resulted in meeting the deadline for the building delivery without any additional rework, and both reduced price for the owner and increased profitability for each contractor.

As for *vertical action*, the same improvement process was also relevant and experimented in most subcontracting companies. Many actions consisted in up-grading the Management's role in order to avoid shifts in function and overlaps and redirect their job design towards anticipation and integrated training as opposed to the day to day regulation of dysfunctions.

This process raises the issue of who decides the process, the objective and evaluation. It is crucial to mention that this qualimetrics intervention-research

process is based on ongoing interaction between the actors on the one hand, and the researchers on the other hand. It is a contradictory intersubjectivity process which results in a transient agreement on the improvements to be made and those achieved. The researcher's role is not restricted to that of an observer, since he or she is right on the start of the intervention-research an active participant in the inquiry process.

Participative and co-designed socio-economic management tools

Socio-economic tools are co-designed with the actors, and they are not to be slapped on in every management situation, but are meant to be co-designed, altered and adapted according to the actors specific needs. They are also aimed at developing a more systemic vision among all actors by providing them with a minimal shared language broken down into six main management tools: Internal and External Strategic Action Plan, Priority Action Plans, Competency Grids, Time Management, Strategic Piloting Logbook, Periodically Negotiable Activity Contract.

Examples can be presented in the case of the construction site:

- Internal and External Strategic Action Plan: the construction site was considered as part and parcel of the strategy of the owner, as it was meant to be a showcase building and a learning process opportunity. The four main objectives were:
  - Due respect of the environment: harmonious integration in the natural landscape, high quality insulation, easy access to the disabled and enough space for children play-ground.
  - Permanent character of the building and resistance of materials entailing reduced maintenance costs.
  - Job safety, with a zero accident objective during the construction process.
  - Compliance with higher quality objectives and reduced cost of the building and on time delivery.

- Time management:
  - It consisted in negotiating the conciliation of the various specific plans supplementing the master plan.
- A specific point in the agenda of all meetings was devoted to the show-apartment, which allowed both just in time delivery of this apartment necessary to rent the whole building, and make slight adjustments to improve the finishing if necessary, in particular regarding some materials such as doors.
- During the completion phase, it was necessary to very precisely negotiate an overall time-table so as to avoid workers treading on each other toes and a clash between various contractors working simultaneously and in haste.

These examples show how the Qualimetrics research method was not only an improvement process, but also coped with the sensitive issue of management tools which need to become more comprehensive and system-wide to enable each and every actor to better take into account systemic decision frameworks and long term economic performance.

c) Political and strategic decisions

There may exist some sort of perverted inter-play between contractors when every actor strives to reject responsibilities for dysfunctions on the others, hence the Qualimetrics intervention-research made it possible to reconstruct several rules of the game such as the following:

- To avoid some kind of underhand financial compensation verging on fiddling in case of quality defects, a transparency rule has been enforced during weekly on-site meetings.
- Higher involvement of the contracting authority who keeps a watchful eye, as compared with the project manager because of the long life-span of this building.

3. Discussion

Qualimetrics research is therefore aimed at describing the whole system of organisational change, which requires an extended period within the organisation from the part of researchers.

We propose to underscore specific contributions of qualimetrics research to action-research: attitude towards actors in the field, managerial and economic impacts, and epistemological choices.

Attitude towards actors

Information is not exclusively captured from an outsider position, as it is often the case when only using questionnaires or analysing documents and company archives. The researcher actually becomes an insider (Coghlan, 2001). He/she thus develops a better grasp of the organisational change through the interaction, part and parcel of the intervention process, with the other actors. It is an in-depth and up-close scrutiny of the field.

Qualimetrics is a "shuttling" between research field and the lab, to take profit of distance-familiarity oxymoron principle. However, Qualimetrics research methodology may contribute to action-research methods: it is not only a research process *in* the organisations and *with* the company actors, but also research *on* organisational transformation phenomena. Company actors are led to alter their own representation of their company and consequently to modify their behaviour on the workplace. Qualimetrics has an explicit transformational intent and is overtly aimed at all-out transformation, which is emphasised at each and every level of the organisation. This is made possible through the implementation of the Horizontal and Vertical (HORIVERT) architecture and process. This principle is linked with the synchronised decentralisation principle which is aimed at transferring the initiative of the decisive act to the responsibility level, where its implementation will be launched, while setting up game rules (*communication-co-ordination-co-operation*) that ensures its compatibility with actions of other zones of responsibility and with the strategic piloting of the entire organisation. In the example of the case study, the traditional entire delegation of the co-ordination of the construction site to the project manager, along with low

involvement of the contracting authority is an illustration of poor synchronized decentralisation. The qualimetrics research enabled to restore the validity of this principle and to better ensure sustainable performance.

Like in action-research approaches, qualimetrics research method draws on the collection and processing of materials from various observation posts within and outside the organisation: participation in the life of the organisation to capture information, iterative cycles of identification of change phenomena. Qualimetrics research also screens the actors discourse: what has been the outcome of the intervention-research carried out when compared with commitments taken at the early stage of the process. Flimsy issues can then be separated from in depth problems, thanks to the immediate observation of actors' behaviour in contrast with the more or less objective opinions they may have expressed before implementation of the change process. In qualimetrics intervention-research, actors' comments are not only based on a participative diagnosis and project. It also permits studying problematics related to change as soon as they emerge and the exploration of possibilities. Eventually, it facilitates the passage from the specific to the generic and contributes to further this process through conducting dynamic *in vivo* observation of longitudinal phenomena, which enables us to grasp the meaning of decisions and behaviours and also contributes to generating new theories or new concepts. Indeed, qualimetrics research makes it possible to observe in-depth various integration problems and affords insights into the complexity of organisational operation while bridging the gap between theorisation and implementation.

Managerial and economic impacts

A contribution of qualimetrics intervention-research to action-research methods is its focus on measurement, because it makes it possible to quantitatively assess the qualitative impacts of the research process. This is why the qualimetrics methodology implies the setting up of what is referred to as the "*economic balance*" of the change action. It consists on the one hand in measuring the tangible and intangible investments devoted to the change process (mainly materialised in a number of additional working hours stemming from the implementation of the intervention process), and on the other

hand, the impacts on the visible and hidden costs. E.g, the qualimetrics research on the construction site required the careful examination of the lay-out of the ground selected for constructing an apartment building: it was time consuming up-front, but eventually resulted in weeding out numerous time wasting factors not only with regard to the building process, but also to the well-being of the future inhabitants.

Qualimetrics intervention-research is also aimed at rebuilding the organisation in a participative way with the actors concerned at all levels. Since 1981, the ISEOR research centre makes it a pre-requisite for the firm to agree with the deconstruction-reconstruction approach without limiting the intervention-research to deconstructing, because it would mean adopting a cynical and even irresponsible stance under pretence of so-called neutrality and unbiased attitude. On the contrary the construction and deconstruction approach/ methodology are the core of the intervention-research process and are used to obtain data and are the root of actionable knowledge

The qualimetrics research obviously shares common points with action-research principles i.e. it is not a solution-kit, like in management consulting, but an overreaching method which enables bringing together the various logics of actions of the actors in the field. However, with regard to the diagnosis phase it also contributes to action-research in that there is a focus on the economic impacts of the dysfunctions ("hidden costs"). Furthermore, in the mirror effect phase when bringing out the actors' unvoiced comments ("*non-dit*") researchers tackle the unconscious perception of the actors and finalise their diagnosis by reporting major dysfunctions they themselves perceived, but that were not mentioned by actors during the interviews.

Qualimetrics intervention-research is not aimed at revamping and face-lifting organisations but at strengthening upfront the hidden infrastructure on which to raise permanent visible superstructures of the building: infrastructure is defined as a framework that organises and co-determines the quality, coherence, effectiveness and efficiency of the organisations operations. These frameworks are not readily visible and often omitted when carrying out decisive actions. Now, as V. Zardet aptly puts it: "strategic innovation results from strategically analysing and acting on the *hidden infrastructure*_of the organisation. In analogy to building terminology, the hidden infrastructure

refers to the foundation components required to carry out the company's characteristic business activities, which make up the superstructure of the company" (Buono, p.60 ch. 2 by V. Zardet).

Taking into account that each and every actor has a stake in the origin or prevention of the dysfunctions, it is part and parcel of the qualimetrics intervention-research method to require the participation of all the actors in the reconstruction process and to help them take their part in the decentralised synchronisation process accordingly. Our various and multiple experiments showed us that the most efficient approach was to articulate all the actions aimed at improving the different sectors of the organisation, which requires linking together all the sectors in a common architecture.

Periodical *clean-up* is necessary when superstructure has been raised, as in the case of buildings if they are not periodically looked after. E.g. Priority Action Plans enable to conduct preventive actions every six months and to weed out causes of dysfunctions, similarly to the necessary cleaning of buildings if deteriorations eventually leading to decay are to be avoided. The more fragile element of the structures of the organisation are periodically kept under surveillance through negotiable activity contracts, which have to be regularly overhauled to avoid structural tensions in the system.

As mentioned earlier, qualimetrics enables the qualitative, quantitative and financial evaluation of the impacts, as exemplified in the table presented below which shows how actors have assessed the improvements. Examples can be given for some of the contractors:

- Improved co-operation on measures in the work-plan: e.g. the carpenters saved 100 hours as compared with the average waste of time on other similar construction sites.
- Increased stability: e.g. plumbers saved time due to less staff turnover, and also observed less mistakes and productivity losses (equivalent of 3% productivity increase on average).
- Better synchronisation of contractors along the project, resulting in less overlapping, meddling and messing and cascading delays: the equivalent of a minimal 2% productivity increase has been observed by contractors as compared with all other concurrent construction sites where those contractors were involved.

– -Anticipatory delivery of materials and equipment on the construction site, enabling less time lag and waste of time experienced by contractors (over 1% productivity increase across the board for each contractor, and even more for those sub-contractors who are called in a the completion of the building.
– -Better co-operation between contractors: painting made on better prepared and cleaned walls, less deteriorations of the tubs, doors, windows, etc. E.g. painters gained over 100 hours out of 3,400 hours of the overall intervention.
– -Less thefts, including those due to insiders thefts.

All these data result from the contradictory inter-subjectivity research process mentioned earlier, where all actors have been interviewed, before mirroring the results to them, while minimising the calculated amounts. Overall, the select items in the list of improvements as those given above could be added up to propose an overall evaluation of the results obtained (see table 2 below)

Table 2: Example of qualimetrics evaluation of the impacts of the research process outcome

€	Quantitative evaluation	Financial evaluation
Improved co-operation on measures in the work-plan	Minimal 806 working hours saved	€ 26, 600
Increased stability of the personnel and lower staff turnover	Less overtime due to the low productivity or recently recruited employees (1,200 hours)	€ 39, 600
Better synchronisation of contractors	Over 400 hours waste of time saved	€ 13, 300
Anticipatory delivery of materials and equipment	Less overtime (600 hours) and reduction in overconsumption	€ 26, 500
Improved co-operation between contractors resulting in less degradations	Less rework : at least 270 hours saved	€ 8, 900
Less thefts of materials, including insider thefts	All contractors observed a reduction in thefts. The amount saved could be evaluated only for the carpenter, as compared with the average amount of thefts on other construction sites	€ 3, 500
Overall amount of the improvements	**At least the equivalent of 4,5 overall amount of the cost of the building**	€ 118, 400

Such an evaluation process is not restrained to obtaining practical results, but also contributes to scientific research as an additional test to the qualimetrics intervention-research scheme.

Advantages and limits

Throughout the organisation, qualimetrics research enables to reveal latent and underlying interactions which are not accessible to external observers, thanks to in depth and up-close scrutiny of significant phenomena through a longitudinal process overtime. It also permits studying problems related to change as soon as they emerge and the exploration of possibilities. Eventually, qualimetrics intervention-research facilitates the passage from the specific to the generic. It is also a dynamic *in vivo* observation of longitudinal phenomena, which enables to better grasp the meaning of decisions and behaviours. As illustrated in the case of the construction site, it contributes to generate new theories or new concepts. Indeed, it made it possible to observe in-depth various integration problems and afforded insights into the complexity of organisational operation while bridging the gap between theorisation and implementation. In doing so, it produces simultaneously contingent knowledge, which is helpful for the actors, and generic knowledge, which should lead to generalised scientific rules. However, a qualimetrics process can be seen as excessively time consuming, e.g. over 1,050 hours of intervener-researcher had to be devoted to the experiment on the construction site. Another limit is that the objective of studying all the facets of an organisation (the construction site in the above mentioned case) necessitates a collaborative form of research, not only between qualimetrics intervener-researchers and organisations, but also between researchers and research centres sharing the same methodological protocols. Stand alone action-researchers would have a hard time to co-construct such a complex object, as this kind of research is not yet so much encouraged nor supported by academic institutions. Research team-working is therefore a challenge.

Conclusion

Qualimetrics research is aimed at improving the impacts of action-research by setting up the generic contingency principle. As above mentioned in this paper, it requires the use of hybrids of qualitative, quantitative and financial data. It also requires taking into account the fact that organisations are complex objects and should be observed from an organic perspective, i.e. continuously transformed and modified over time. Like most approaches to action research, Qualimetrics research is aimed at enhancing the creation of insights (Coghlan, 2010) on management situations, and inventing new management frameworks in order to better understand the complex phenomena in the action system and in the change processes. It helps company actors design and implement adequate management models and tools in reference to pre-defined specific problematics. Qualimetrics partly differentiates in that the problematics emerge as the process unfolds (Savall, Zardet, & Bonnet, 2001-2008). Qualimetrics research not only results in context-specific knowledge, but also in setting up generic methods of organisational transformation.

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