An enabling intervention to set in motion the perpetual self-analysis and self-design of the organisation

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This communication deals with a participatory organisational design project developed for the Subway Signalling Maintenance Division of the Railway Transport Company of Paris (RATP). This research aims at designing and implementing an enabling methodology to achieve two goals: to develop both an enabling environment and an enabling organisation and to ensure their sustainability beyond the EHF specialist intervention. According to these goals, we defined and conducted our EHF intervention as a pedagogical process to facilitate first the organisational training in reflective and self-design capability and then the training in perpetuating this capability. Two kinds of training were put in place: by action (participatory reengineering process) and by reflection (participatory experience feedback situations).

Keywords: railway transport, constructive ergonomics, participatory organisation re-design, enabling intervention, sustainability of organisational autopoiesis.

1. Introduction

This research aims at designing and implementing an enabling methodology to achieve two goals: 1) to develop both an enabling environment and an enabling organisation (Falzon, 2014; 2015), 2) to ensure their sustainability beyond the EHF specialist intervention.

We considered an enabling environment as multiple states that allow agents, groups and organisation to empower and develop themselves continually. Such an environment provides people with resources including knowledge, organisational structures, social interactions, autonomy and opportunities for action. This allows people to learn, develop and master an organisational reflective practice and a self-design capability.

We considered an enabling organisation as a self-design system (Weick, 1977) consisting of two aspects. A result of a permanent redesign activity implemented by the organisation's key members (users of the system) and a process of perpetual collective enquiry (Dewey, 1939) and of sense-making (Weick, 1993) of the organisational structure and collective practices and dynamics. This process allows a continuous redesign of the work conditions to increase people's wellbeing and organisational performance.

In the result case, the organisation is continuously shaped according to current activity needs; it is characterized by a perpetual change as a result of a reflective state and dynamic. In the process case, the focus is on the iterative organisational reflective practice generated by the transverse interplay of its members.

We hypothesize that the sustainability of the enabling environment and organisation depends on the ability of people, groups and organisation to analyse, debate and redesign themselves and on the reflective practice that allow people, groups and organisation to take their change process as an object of analysis and redesign. According to this assumption, we defined and conducted an EHF intervention as a pedagogical process (Dugué et al., 2010) to facilitate first the organisational learning of reflective and self-design capability and then the education in perpetuates this capability. In other word, EHF intervention allows the actors to construct the resources required for the organisational autopoiesis.
2. **Context: maintenance processes of the Parisian subway signalling systems**

This project was developed for the Subway Signalling Maintenance Division of the Railway Transport Company of Paris (RATP). This division performed an insourcing process of the operational function (the activity of maintenance operators) in order to achieve strategic and economic goals. Due to the high level of organisational complexity, the insourcing process determined a major organisational reconfiguration, bringing together the Logistics and Engineering Function, the Control System Service, the Maintenance Operators and the Technical Service, as well as functional changes at the operating level. This reorganisation led to several difficulties shortly after being implemented.

The project aim was then to design a new structure (rules and procedures) and functioning of the previously introduced organisational reconfiguration and to enhance work conditions and service performance.

In order to accomplish this objective, an ergonomic intervention was conducted. It included three phases:
- a work analysis covering the whole process influencing the maintenance of signalling devices;
- a developmental phase consisting of a collective process analysis and reengineering of organisational practices. This was implemented by managers and agents of all departments of the Division;
- in parallel to the implementation phase, a phase of sustainability, the goal of which was to perpetuate the method experimented by the agents themselves in the previous phase.

3. **Method**

The method was designed in order to fulfil pedagogical objectives. We developed ad hoc learning situations and combined several techniques in order to help organisation members to discover and perpetuate their self-reflective and self-design capability. In our view, enabling EHF interventions have a pedagogical dimension and seek to put in place two kinds of learning 1) by action and 2) by reflection, which are described below.

3.1 **Establishing an exemplary space for participative organisational reengineering: learning by action**

Considering learning by action, we established the organisational conditions that would enable self-design and self-reflection to occur. With this aim, an organisational design project (Garrigou et al., 1995; Garrigou et al., 2001; Barcellini et al., 2015) was established. A constructive and participative approach (St-Vincent et al., 2000) was used to design organisational practices and new processes of organisational functioning. As a consequence, the work conducted in reengineering groups played an exemplary/illustrative role.

Top, middle and operative management of all five departments (Logistics, Engineering, Control System Service, Maintenance Operators and Technical Service), as well as the division leader, HR and security leader were involved into participatory reengineering process of the Signalling Division.

In particular, we implemented different kinds of work debate spaces in order to allow people: 1) to look at the organisation as a whole and in a holistic way; 2) to learn how to look at the organisation as an object of analysis and redesign; 3) to learn how to take their change management as an object of reflection and optimization.

3.1.1 **Looking at the organisation as a whole in a transverse way**

We gradually led all agents to construct a collective cognitive map (Weick, 1993) of the whole organisational process starting from a collective process analyses driven by a cartography implemented by EHF researcher. This artefact was established from the evidence collected during previous work analysis phases and functional participatory working groups. At this stage, we implemented three working groups involving at the same time: the division leader, functional middle management, one operative manager for each department (Logistics, Engineering, Control System Service, Maintenance Operators and Technical
Service) and the security leader. Each working group was composed of 12 to 15 people and lasted three to four hours. The participants were involved in a collective inquiry of the working process. The expected outcome was to identify some classes of risky situations affecting the reliability of organisational answer. For each one, named « Projecting interface situations», the EHF researcher asked the participants to identify 3 representative cases to be analysed at the following stage.

3.1.2 Learning how to look at the organisation as an object of analysis and redesign

In order to learn how to look at the organisation as an object of analysis and redesign, nine working groups were set up. They lasted three to four hours and involved the same participants as the previous stage. They were involved in a detailed analysis of the defined cases. This stage aimed at pointing out the sociotechnical elements that disrupt the expected effective cross-functional interaction, as well as the collective recovery strategies that took place.

Such a collective reflective dialogue was supported by cartography of the facts that progressively allowed a collective shared story telling of the case. Any discrepancy between expectation and result was considered as a starting point for reengineering a new match between cross-functional interactions and organisational structure (rules, process, and work division). All the organisational solutions proposed were analysed by a steering committee. Four working groups were established, each one lasted two hours. This corporate executive were composed of the Unit Top manager, division leader, middle management of all five department (Logistics, Engineering, Control System Service, Maintenance Operators and Technical Service), and the HR and security leader.

3.2 Learning how to take their change management as an object of reflection: construing the organisational autopoiesis process

Considering learning by reflection, in order to allow people to learn how to perpetuate these self-design and self-reflective capabilities, different kinds of pedagogical situations were established.

Firstly, one working group lasted more than three hours and involved the reengineering group’s participants. The collective reflective activity focused on participatory reengineering process. It involved thinking about ways in which participants used to analyse the work process and establish solutions to improve it. The issues debate focused on the results achieved and the strategies supporting solution making. Specifically, a five criteria grid (pertinence, effectiveness, efficiency, impact and sustainability) was employed.

This stage recalls Schön’s “reflection-on-action” concept, in which he stated that “We reflect on action, thinking back on what we have done in order to discover how our knowing-in-action may have contributed to an unexpected outcome” (Schön, 1983, p. 26). A dialogical sense making (Weick, 1995) aimed at establishing a whole share reconstruction of practices.

Secondly, six working groups, each lasting more than three hours, were steered by the department managers. This debate section aimed to co-design the means for the project management. Each section was accompanied by briefing and debriefing activities carried out by the EHF researcher.

Finally, five training sections were directed at department managers. The issues concerned problem resolution and project management competences. Each section lasted more than three hours.

4. Results

In this section we present the results of the developmental and the sustainability phases our project-research. Each one allowed to realize four kinds of processes: strategic processes, means, materials processes, and intangible processes. All these types of processes are discussed below (Tab. 1)

Table 1. Processes allowing the progressive implementation of the organisational autopoiesis.

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<th>Developmental phase: organisational cross reengineering</th>
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### 4.1. Strategic processes

This kind of processes consists of a set of strategic choices and behaviours allowing the transfer of management. This production refers mainly to the EHF researcher actions, having a direct impact on the participants’ commitment. Strategic productions give the frame for the action.

During the developmental phase diagnostic report and schedule of conditions supply the methodological frame to be used for the cross reengineering activity. Global process cartography, implemented by the EHF researcher, represents the base to start a collective reflection and analysis on the organisational process. Moreover, the debate on work process was characterized by democratic rules: hierarchical ties were flattened and all departments have participated to the discussion. During the work debate groups the management of discussion was gradually transferred to the participants. Also, different kinds of pedagogical resources (rules schedules, planning of sections, objectives, order day, didactical materials) allowed the participants to realise the task, to maintain a common representation of the objectives achieved and those to be realised.

During the sustainability phase, the EHF researcher intentionally transferred the steering of the process for co-designing the means of running and managing the project. The researcher accompanied the participants in the management of the process by means of briefing and debriefing activities during the discussion sessions. The coordination of the various departments was then ensured by a system of reporting.

### 4.2. Means and materials processes

These kinds of processes consist of the concrete activity carried out by the participants during the work debate groups and the output produced. Firstly, participants were involved in a collective global work process analysis. The output of this stage was the identification of the situations particularly critics for the division performance, named « projecting interface situations». Also, the participants proposed three cases for each type of situation, as a typical example.

Secondly, the participants carried out a detailed analysis of eleven cases previously identified, which allowed co-production of the organisational solutions. The output of this stage was several cartographies and an action plan summarising all the organisational solutions proposed.

Thirdly, an experience feedback was carried out on the cross reengineering project. This activity allowed the readaptation of the design of the successive stages of the co-design of steering devices. Finally, training...
in steering and problem resolution was directed at the key division members (department managers and quality manager). The output of this stage was the production of a project management procedure, an organisational experience feedback procedure, and several process schedules.

4.3. Intangible processes

The articulation of the strategic processes, means and material processes enabled the construction of intangible resources, including the skills, attitudes and managerial commitments required for the gradual transfer of the management of organisational transformation processes. This kind of processes consists of the resources required for the implementation and sustainability of the organisational autopoiesis process.

During the developmental stage, a transverse diagnosis of the global maintenance process firstly helped build a common cognitive and operational frame of reference (Chabaud, De Terssac, 1990; Re, 2001a), a mutual understanding by the participants involved in the process of the reciprocal impact of their activities. By diagnosing the global process, the participants developed an ability to analyze processes according to a shared vision of the system: the organisation was seen as a whole object.

Secondly, this acquired knowledge made it possible to carry out a detailed analysis of the bottlenecks and obstacles to service performance and to co-design the most appropriate organisational solutions. This work enabled the development of problem solving skills and reciprocal inquiry. This stage was also characterized by a gradual increase of initiatives from participants in the steering of discussions, the arguments handled, reciprocal self-investigation and the search for consensus in the creation of organisational solutions. The organisation was ultimately seen as an object that could be reworked with the right intervention.

These intangible processes were built from the concrete implementation of the transverse reengineering the participants learned through experience. These achievements represent embedded skills, of which the participants were not necessarily conscious.

During the sustainability phase, the previously acquired skills enabled the participant to analyze and reflect on their own project management practices and subsequently to control the design of project management tools. By performing these previously embedded activities, they became unembedded. The autopoiesis was processed and incorporated into the organisational culture.

5. Discussion and conclusion

The main objective of this study was designing and implementing an enabling methodology to achieve two goals: to develop both an enabling environment and an enabling organisation able to ensure the sustainability of their re-design beyond the EHF specialist’s intervention.

Our research developed a multi-level participation and attempted to go beyond the traditional ergonomic intervention to shift to an enabling one, applying specific techniques to the different organisational levels to activate a generative and iterative design of the new organisation. We used the reflective activity and co-design as a pedagogical tool to develop mutual understanding and the capacity of the participants to work collectively. The process allowed end-users to become designers of the new organisation, starting from the analysis of the difficulties of real activity. The research improved the system’s reflection on the organisational routines, enhancing performance consistency and effectiveness.

The various strategic choices of structured spaces for debate and reflection (educational methods used, themes debated and the resulting collective dynamics) enabled the progressive construction of the resources required to set in motion the autopoiesis process of the organisation, with the aim of ensuring the sustainability of the capacities of the organisation and its participants.

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References


