Designing a Collective Undertaking and Systemic Modelling: Potentially Fertile Concepts

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Abstract
Goal-directed collective undertakings are rarely monolithic and if the context in which an action takes place is not properly taken into account in the design process, its implementation will run into numerous pitfalls. Context identification appears to be a complex task as soon as one moves away from a ballistic view of the design-and-implementation process. Indeed, in this case, design of the undertaking and identification of that undertaking relevant context are recursive processes. In this paper, we discuss how some concepts from Systemic Modelling [Le Moigne, (1990a) & (1990b)] and from "Complex Thinking" [Morin, (1985) & (2000)] may help one carry out this task.

Keywords :
Systemic modelling; complexity; environment identification; representation.

1. Introduction

Designing a firm's strategy, reorganising a production unit to adapt it a to a zero-stock policy, defining measures to help reduce a country unemployment level, finding ways out of a conflict, imagining ways to discourage terrorism… These examples show that goal-directed collective undertakings are rarely monolithic : they embody a number of local actions that need to be mutually congruent. Hence, the design-and-implementation of a collective undertaking can be viewed as a complex process, the word "complex" being taken in the following sense [Le Moigne (1990a), p. 3]: "*a phenomenon is said to be perceived as being complex when it has the following property: no single finite model, no matter how large, how complicated, how stochastic, etc., it may be built, seems capable of representing exhaustively that phenomenon*".
The complexity of the design-and-implementation process is a theoretical reason to turn to Systemic Modelling [Le Moigne (1990a) & (1990b)]. There is also a practical reason. Experience shows that if the context in which the action will take place is not properly taken into account in the design process, its implementation will run into numerous pitfalls. Systemic Modelling provides conceptual tools for modelling the action context as the environment of a system.
Sometimes, there is an obvious way to associate a system with the intended action. Sometimes, it is not as straightforward. In the first case, what may seem obvious at first sight may nevertheless turn out to be not so clear after deeper study of the problem. In practice, defining the system and identifying its relevant context in order to design and to implement successfully a collective undertaking, turn out to always be a complex task.

In this paper, we shall discuss how some concepts from Systemic Modelling and from "Complex Thinking" [Morin (1980) & (2000)] may help one build rich pictures of a relevant context for a

contemplated collective undertaking. Beforehand, we state briefly some basic propositions on the artificial nature of the system and its context.

2. Systemic modelling of the problem

2.1 Preliminary remarks

In this paper, we shall focus on the basic problem of a collective undertaking design, that is the design of a goal-directed change within an institution by members of that institution.
To distinguish the real-life problem from its systemic model, from now on, we shall use the expressions "system", "mission" and "environment" when referring to the systemic model of the problem, while keeping the terms "action", "goals" and "context" when referring to the "real-life" problem.

2.2 The system and its environment are not given realities

By definition, the systemic model is built in order to support the undertaking designers' reasoning process. The general procedure, which is called "systemography" [Le Moigne (1990a)], indicates how to represent a phenomenon as a system, but it does not (and it cannot) tell what the scope of the system should be, i.e. what the system should encompass, because this depends largely on the designers understanding of the problem at hand. Fixing the system's scope is a crucial design decision.
The system's scope, environment and mission are defined in reference to the goal and context of the intended action or undertaking.

2.3 The action context is not a given reality

The action context is a priori unlimited. Because of human limited cognitive capabilities, one perceives only a limited number of features of that context. As K. Weick (1979) and J. Pfeffer & G. Salancik (1978), among others, pointed it out, organisation context is created by a process of attention and interpretation. In other word, what is represented as the system's environment is not the actual context of the undertaking, but the designers' perception and interpretation of that context.

2.4 The perceived relevant context depends recursively on the action goal

Among perceived features of the action environment, only those that the designers consider to be relevant to the problem at hand will be taken into account. Deciding which are the relevant features is also a crucial design decision. It depends obviously on the action goal, but also, in a more insidious way, on designers' individual goals, preferences and interpretation capabilities (which depend on their culture, on the way they understand the problem, etc.).
Conversely, what is defined to be the relevant action context influences the scope of the action goal. For instance, in a strategy design process if the CEO considers that his firm's relevant geographical context is the French market, this will lead him to consider only national strategies (and no internationalisation strategies).

Definition of the system, of its mission, and of its relevant environment are intertwined crucial modelling decisions. Hence, it is essential that those decisions be made iteratively and be reconsidered regularly as more insight in the problem is progressively gained. Another reason that calls for recurring revision of the way the system and its relevant environment are defined comes from the fact that no-one can be certain that all context features that will prove relevant *ex post*, have been perceived *ex ante*, and, even if this is the case, that they were judged relevant at that time.

3. Building rich models of the action context to improve understanding

Our fundamental assumption is that rich representations of the context create favourable conditions for successful action design-and-implementation. Systemic Modelling enables one to build models by knitting interdisciplinary principles and general concepts with knowledge specific to the concerned field (social work, therapy, town planning, etc., and, in our case, management). Moreover, its emphasis on modelling phenomena not only as we perceive them currently, but also as they have evolved through time, reminds us of how important it is to take into account the history of the situation under study.

3.1 Identify the system' processed flows and process fields

Systemic Modelling depicts the system's environment as being composed of various interveners and of various active process fields which influence the system.
Outside interveners with whom the system is in direct relation, i.e. the emitters of system's inputs and the recipients of its outputs are *a priori* interveners potentially important for the system. Interpreted in the area of management, we naturally find these interveners to be the customers, the suppliers, the shareholders, the prospects, the banks, the regulation agencies...
The notion of process fields permits to capture other environmental factors that may not be in direct relation with the system, but which influence it. For instance, in the area of management, the competitive, the financial, the economic, the technological, the informational, the societal, the cultural, the political, etc., fields.

3.2 Representation of the action context as an ecosystem

In some cases [Avenier (1993)], it may be relevant to model the action context as an ecosystem, i.e. as being composed of interacting systems, whose interactions have organisational properties similar to those which take place within the natural ecosystem. E. Morin (1980, p. 21) calls this sort of organisation an eco-organisation: "*An eco-organisation is a spontaneous organisation, which happens without being prompted or constrained to do so by a program, without an autonomous memory or its own computing capabilities, without being defined by a control, regulation, decision, or government agency. On the contrary : eco-organisation emerges from 'selfish' actions, 'myopic' interactions, fuzzy and noisy inter-communication, in niches without enclosures or barriers*".

Whenever it appears relevant to represent the action context as behaving as an ecosystem, such a metaphor may give some fertile hints to help understand, represent and simulate a possible functioning of the action context. For instance, in the natural ecosystem, the relations among living organisms can be complementary (association, symbiosis, mutualism), competitive, and/or antagonistic (parasitism, predation), some of them being both antagonist and complementary (cf. the dialogical principle evoked below). Co-operation goes sometimes with cheating and treachery. These properties can be interpreted metaphorically in the management field to describe, suggest or anticipate behaviours among economic units.

3.3 The action ecology principle

A collective undertaking, besides its expected positive effects towards the pursued goal, may have some expected collateral effects counter to the aimed goal. This is accepted as long as the expected positive effects seem more valuable than the expected negative effects.
The action ecology principle, which is congruent with representing the action context as an ecosystem, states that a collective undertaking escapes its originators as soon as it is

launched, and becomes somehow autonomous. In other words, collective action implementation never reduces to pure execution of pre-defined action plans, and design activities keep taking place locally, if not globally, during the entire implementation process. This implies that besides the expected side effects evoked above, a collective action may have unexpected consequences, those consequences being possibly favourable or detrimental to the pursued goal.
This principle, in particular, draws attention on the importance to be continually vigilant on the effects of the action as it is actually implemented.

3.4 The dialogical principle

The dialogical principle states that within complex phenomena there may coexist two principles which are contradictory and nevertheless cannot be dissociated, such as autonomy and dependence. When designing a collective undertaking it is important to identify the dialogical processes which may operate in the action context. It might also be judicious to introduce some dialogical processes in the designed action such as the coupling of a deliberate strategy formulation process with a process for capturing emerging opportunities.

4. Some further research topics

While enacting the fundamental knowledge-creating loop in the sciences of design [Le Moigne (2000)], "knowing for doing" & "doing for knowing", we have run into a number of practical questions such as the following ones.
By definition, no single model can capture exhaustively a phenomenon that is perceived to be complex. One can be tempted to keep enriching indefinitely the model one is building of a complex phenomenon. So far, to make the decision of stopping the modelling effort, one has to rely on the argued collective judgement of the group of people involved in the modelling process, and then keep in mind that the map not being the territory, everyone has to remain attentive to the relevance of the model and on the unexpected events that may occur. Could Systemic Modelling contribute to set fourth guidelines that could help people decide whether they can reasonably stop, at least temporarily, their modelling effort?
Another related question is the crucial problem of strategic scanning that can be formulated as follows. How to identify that a new trend is emerging in the firm's context, before it is perceived by other actors? Do we have other choices than simply relying on interactive reflection in multidisciplinary teams, and on general culture, intellectual curiosity and intuition of these teams' members? Can Systemic Modelling contribute to devise tools that would help people make some sense out of an unorganised "mess" (this sense-making being furthermore capable of being appropriated by the market thereafter)?

Enacting the loop "knowing for doing" & "doing for knowing" also raises the problem of finding existing organisations willing to embark with researchers on the risky adventure of action-research where new ideas are experimented in real-life settings. It also raises the more fundamental question of what can be generic knowledge when each organisation is recognised as being unique? After the sciences of design, will it be judicious to define some sciences of the singular?

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