IESE
UNIVERSITY OF NAVARRA

PROCESS INNOVATION: CHANGING BOXES OR REVOLUTIONIZING ORGANIZATIONS?

Rafael Andreu*
Joan E. Ricart**
Josep Valor*

RESEARCH PAPER No 307
February, 1996

* Professors of Information Systems, IESE
** Professor of General Management, IESE

Research Division
IESE
University of Navarra
Av. Pearson, 21
08034 Barcelona - Spain

PROCESS INNOVATION: CHANGING BOXES OR REVOLUTIONIZING ORGANIZATIONS?

1. Introduction

The idea of centering change and improvement programs around the concept of «business process» has been mentioned in various forms since the seminal work in TQM (Deming 1972; Crosby 1979; Juran 1992) and BPR (Hammer 1990; Davenport and Short 1990). The «process» concept in its full extent is appropriate because it helps the manager to pay attention to the client: the stakeholder who is supposed to appreciate and pay for the value added by the set of activities that make up a process. Thinking in terms of processes also removes the functional bias that has characterized many of the business analyses of the past, emphasizing cross-functionality and opening new horizons for business activity improvement.

BPR, in addition, emphasizes radical improvement. Radical improvement rests on the idea of substantially reconsidering the old ways of doing business, not only from the wider perspective implied by looking at the company from the process point of view, but also by doing away with traditional procedures, challenging the old, central hypotheses on which those procedures are based. Often this is achieved by making creative use of new technologies, particularly information technologies.

Although powerful, these ideas have begun to prove insufficient. A sizeable number of organizations that have attempted to put BPR ideas into practice have not been successful (Brynjolfsson and Hitt 1993; International Management 1994). Several reasons can be pointed to as causes of such underachievement. Our contention, based on in-depth analyses of 13 cases of companies that have attempted process improvement projects, is that important dimensions are often omitted both in the design and in the implementation of such projects.

We find that to give rise to a new, drastically more efficient process structure it is not sufficient to center an improvement project (albeit process-based) on the nitty-gritty of how the activities that make up the process can be redesigned, re-arranged or re-coordinated. Something more fundamental is needed for successful implementation of projects that deliver drastic improvements: In addition to the «boxes» –the activities– that make up a process, attention must be paid to the learning that individuals and organizations need to undertake in order to make the new design really effective; and that is something that can condition the design itself, not to mention how it is eventually put to work –that is, how it is implemented.

The contention that dimensions other than process seem to be very relevant is associated with the so-called «holistic» approach to BPR that has been put forward recently [Watts 1995, (a) & (b)]. Starting from the observation that «companies... discover that [BPR] implementation difficulties (usually people issues) had prevented the business benefits from being realized», the holistic proposal advises managers to augment the usual basic focus on the «sequence of tasks» that form a process, to include the «people carrying out the tasks» and related issues such as Organization & Structure, Values & Culture, and Vision & Goals. In his latest book, «Reengineering Management» [Champy 1995], James Champy, one of the fathers of BPR, argues along similar lines when he says that «key questions that the actual practice of reengineering... has kicked up, all of which must be addressed for reengineering to succeed, ...are ...issues of purpose, issues of culture, issues of process and performance, and issues of people». The same sort of reasoning has recently been put forward by another of the founding fathers, Tom Davenport [Davenport 1994]: «My view is that you cannot really fully engineer human processes, and both business processes and information management processes are clearly very human.»

What are these other dimensions? How are they related to each other and to the process concept? How can people and organizational dimensions be brought into play in a meaningful way? In a field research project undertaken by the authors during the last year and a half, several concepts and ideas emerged that help explain what the other dimensions are, how they are interrelated and, above all, how and why the design phase is fundamentally different from implementation.

The aim of this paper is to propose a series of conceptual frameworks that attempt: 1) to suggest what the relevant dimensions to consider in the design and implementation of a process improvement project are, 2) to make the learning considerations clearly explicit in the context of process improvement projects, and 3) to explain why a more holistic approach to BPR is not only advisable but necessary in order to be really effective in BPR projects. These frameworks will help to explain why a series of thirteen cases studied in depth are individually so different, and yet their basic characteristics fit a common underlying pattern.

The paper is organized as follows: Section 2 gives a brief description of the in-depth case research carried out, and how it brought to light two dimensions that are relevant for a better understanding of process innovation projects, namely innovation *scope* and innovation *depth*; it describes how the cases under study score in these two dimensions and the pattern that emerges, a pattern that calls for an explanation. Section 3 sets forth a few basic concepts about learning that we think are at the root of the patterns described in the preceding section. Section 4 puts these concepts together with the two dimensions identified in Section 2 to develop a framework that helps us understand the basic nature of the different types of process improvement project and that serves as a reminder of the things that should not be overlooked during project design. Section 5 tackles the subject of implementing process innovation projects; it concludes that a holistic view is unavoidable, indicates the main elements that constitute such a view, and illustrates how they can be used both to explain and to plan for project implementation dynamics. This section serves also as a conclusion.

2. The research project. Two basic dimensions emerge: «scope» and «depth»

The research project was undertaken with the following objectives:

1) To find out what «process innovation» meant, particularly in Spain, from the standpoint both of the firms that engaged in innovation projects and of service companies that offer help in the unfolding of such projects.

2) To understand the relationships between the different elements involved in a process innovation project.

3) To develop a set of management suggestions that will be useful for those interested in setting up process innovation projects in their companies.

The method used for the research project was that of a series of in-depth interviews with high level managers of thirteen companies that had undertaken process improvement projects. Additional interviews were arranged with professionals from service companies that offer process improvement services, in order to understand the basics of their methodologies and learn about their experiences in helping firms to carry out such projects.

The interviews with managers followed an open questionnaire which allowed rich responses regarding a variety of aspects of the projects they had undertaken, such as the reasons behind the decision to set up the project, the procedures and tools used for design, the barriers and difficulties encountered during implementation, and so on, including, eventually, their vision of what the individuals involved and the organization as a whole had learned during the unfolding of the project.

One of the immediate findings was that not everybody meant the same thing by the word «process». Although the «business process» idea was always there, its meaning was not the same in all cases. On the contrary, there was a wide range of what could be called «process scope» in the processes that the different projects attempted to improve. They ranged from what might more properly be called *tasks* to what, in the TQM and BPR literature, would be regarded as genuine *business processes.*

Conceptually, a process-based innovation or improvement effort can be set at different levels in a firm: elementary *tasks*, the *business process*, and an intermediate *subprocess* level. A fourth level, which could be called the *value system,* falls outside the context of the firm, and is also beyond the purpose of this paper. It is appropriate to clarify the differences between these levels, as we will use them below to describe the results of our research. The following table is a summary of the four levels.

Value System	Sequences of activities spanning more than one firm.
Business Process	A structured set of interrelated tasks that exist for the purpose of achieving a specific result for a client.
Subprocess	A smaller set of tasks that cannot be considered a business process because they are not structured enough or do not directly serve a client.
Task	The most elemental form of activity. Usually, a single individual can perform many different tasks.

A *task* can be understood as the most elemental form of activity in a firm. It is normally the responsibility of a single individual (who, nevertheless, usually performs more than one task). Many of the traditional Industrial Engineering and Business Administration analyses have focused on the task concept. Examples of tasks are the mechanical stamping of a component, a data entry operation, or the mounting of a wheel in an automobile assembly line.

We define *business process* as «a structured and interrelated set of tasks which exist and function in an organization for the purpose of achieving a specific result for a concrete client or market». Typical examples are the order fulfillment process, or the new product design process. Thinking in terms of processes in this sense requires a fundamental change in the way we are used to thinking about business activities. Too often, even when talking about processes, the emphasis is on how each of the traditional business functions (production, finance, and so on) can contribute to them, thus forgetting the basic global character of the process concept.

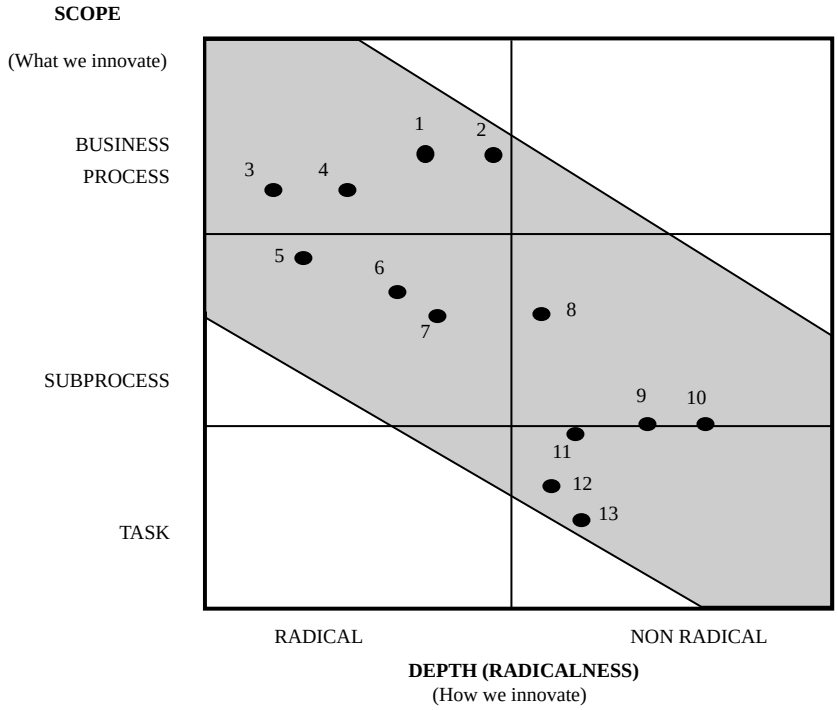
Between the concepts of task and business process there is a whole continuum of other constructs of an increasing degree of aggregation. Somewhat arbitrarily, and in order to be concrete, we refer in what follows to an intermediate level of aggregation that we call *subprocess.* Whereas in a given firm there will be no more than 20 business processes, there may be hundreds of subprocesses and tens of thousands of tasks.

We studied the differences between the companies that focused on the business process level and those that slipped toward task-oriented changes. Our contention is that companies that maintained their improvement projects at a high business process level started out with a clear idea of *radicalness,* aiming at leapfrog improvements. One could say that when companies did apply the «theory» of BPR, looking for «order of magnitude» improvements, they were more likely to keep their level of analysis at the business process level, whereas if their goals were less ambitious, they invariably ended up studying and improving tasks or, at best, small sequences of tasks.

Even informal measures of radicalness (such as agreeing on a ranking from less to more radical, without a specific scale) revealed interesting patterns in the set of projects studied. For example, when projects were plotted on a plane where the two dimensions were the «level at which the improvement is attempted» and the «degree of radicalness in the attempted improvement» (i.e., what could be termed the *scope* of the attempted improvement and its *depth*, or the *what* is improved and the *how*), we obtained a picture like Figure 1, with observations lying only on the shaded area. That is, an improvement effort designed at a high level of aggregation (the business process level) tended to exhibit a high degree of radicalness, and vice versa. Is that logical? Can it be explained convincingly? We clearly needed a better conceptualization of that «degree of radicalness» idea.

When can we say that a given innovation is radical? In our research we adopted the following definition: «An innovation is radical if it breaks the implicit hypothesis on which the old way of doing things was founded.» The question then becomes: What do we mean by these hypotheses, and what is implied by actually breaking them? This question is addressed in the next section.

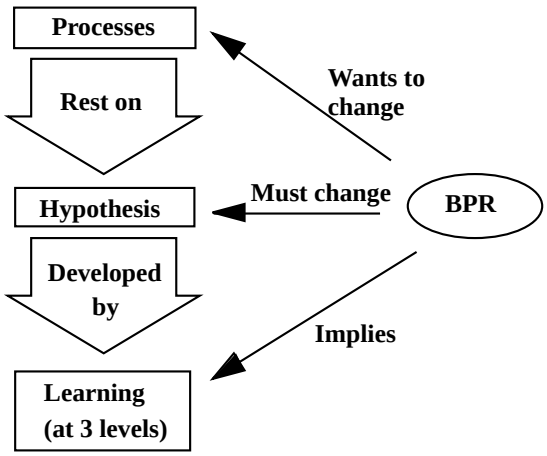
Figure 1. Scope versus Depth



Companies: 1. Commercial bank, 2. Insurance company, 3. Automobile parts manufacturer, 4. Producer and distributor of fresh products, 5. Local government office, 6. Pharmaceutical company, 7. Oil and gas distributor, 8. Construction company, 9. Heavy equipment manufacturer, 10. Small aeroplane and large aeroplane parts manufacturer, 11. Electronic equipment manufacturer, 12. Phone communications company, 13. Railroad operator.

Figure 2 below represents the hierarchy of concepts used in this paper: processes carried out by people are based on hypotheses embedded in their behaviour, and these hypotheses are developed through learning experiences at the individual, organizational and business levels. Since BPR aims at changing processes, it must change hypotheses, and so implies learning. The following sections elaborate on these ideas, exploring the concept of radicalness at three different levels of learning (individual or personal, organizational, and business) in order to develop a better understanding of the basic characteristics of the change programs studied.

Figure 2. Processes, hypotheses and learning



3. Change, Learning and Radicalness

As we just mentioned, the difficulty encountered when undertaking change programs in the BPR tradition is associated with the learning that must take place in order to question and change the hypotheses on which business processes are based.

In a first approximation, it is apparent that these hypotheses, when they exist, exist in the minds of individuals who have adopted them over time –continuously improving them and eventually adopting them as their own, using them implicitly and most of the time almost automatically, as in a reflex action: They have *learned* them. Consequently, breaking or changing these hypotheses implies learning new ones (and, maybe more importantly, «unlearning» the old ones) at a personal level; it implies developing and adopting new ways of doing things, and acquiring new reflex actions.

C. Argyris [1991] has convincingly argued that people tend not to be very good learners; that is, we are not very good at developing new hypotheses on which to base new patterns of behaviour. In particular, people that have been successful in their careers, for example, tend to develop defensive reasoning habits that preclude learning.

At the individual level, we all use our own theories or hypotheses in order to understand reality, handle uncertainty and make decisions. Further, we tend not to challenge these theories; we are not willing to change them because doing so implies more uncertainty, facing the unknown, etc., which is precisely what we attempt to avoid by adopting a theory. In a word, we do not learn, although it sometimes looks as if we do. We change our words but not our actions.

Since hypotheses are personal, the difficulty of change at the personal level depends on the particular individual involved. In one of the cases analyzed, almost everybody in the company had to change their hypotheses in order to make the designed improvements really effective; fortunately, the climate that had developed in that organization over the years had been preparing the switch. Thus, a change that could be classified as radical was, in fact, perceived as «the next logical step» by the individuals involved. This, of course, made the implementation much easier.

But, further, it is also apparent that some of the hypotheses are related not only to personal ideas and concepts, but to what could be called «organizational constants», which are at the root of the organizational behaviour of a given firm. The difference with respect to personal hypotheses may seem subtle, but it is very important, as the mechanisms through which such organizational constants develop are also learning mechanisms, but now at the organizational level, clearly different from those at the personal level. As a consequence, the hypotheses resulting from organizational learning are also different in character and in how they can be broken for improvement purposes.

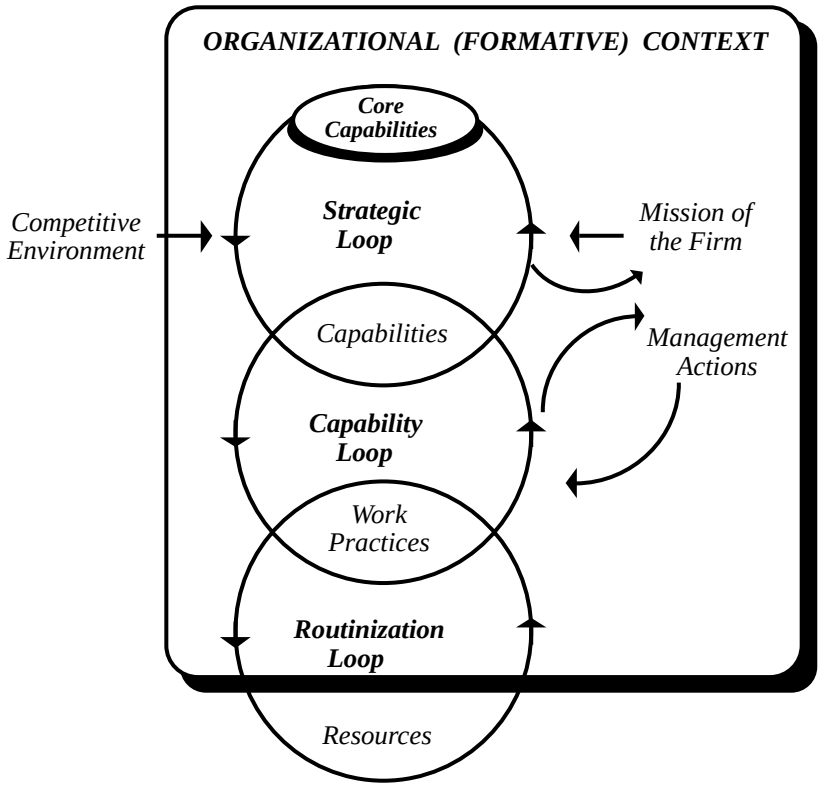
What is meant by «organizational learning»? Andreu & Ciborra [1994] have proposed a conceptualization based on the so-called «resource-based view of the firm» literature, which is appropriate for our purposes here (see Figure 3). They distinguish between three types of organizational learning: 1) from resources to work practices, 2) from work practices to capabilities, and 3) from capabilities to core capabilities.

Transforming the firm's resources (which are undifferentiated and available in the environment) into so-called *work practices* is a learning process involving the routinization and development of resource utilization abilities.

The second level goes much further. It is reached when the organization's members and groups understand how and why the generalization of established work practices creates new potential, as work practices can be used in contexts other than those in which they were first generated. In this way, achieving a higher level of learning than was needed to internalize work practices, organizations develop *capabilities*. Further, the associated learning takes place in a given organizational context, which is specific to each particular firm. Thus, developing capabilities implies «giving a sense of purpose» to work practices, which in turn implies understanding why that sense is relevant in the context of the business in which the firm operates. Consequently, it also implies understanding the business; not doing so results in organizations that are unaware of their capabilities and end up misusing them.

Finally, there are valuable capabilities which contribute to differentiating the firm and are difficult to imitate. These are *strategic capabilities*, sometimes also called *core capabilities*, which are at the root of the firm's competitive advantage. Developing this kind of capability (in that same organizational context or milieu) requires being aware of the relevant characteristics of the competitive environment, and also of the fundamental dimensions of the firm's mission, which makes the associated learning even more demanding, as it places it in a context of genuine strategic reflection.

Figure 3. Basic learning loops in the core capabilities formation process



These three loops allow us to differentiate organizational learning from individual learning, making explicit the difficulties of developing core capabilities, as it requires learning at three levels: 1) work practices, 2) capabilities, and 3) core capabilities.

Again, the implications for the subject of this paper are clear. Changing work practices implies a degree of radicalness very different from that involved in changing

strategic capabilities. There are people issues involved in both, but the organization-related component is very important. As with individual learning, the difficulty associated with the learning needed to develop capabilities depends on the characteristics of each organization; the implied degree of radicalness depends not only on *the change itself* (i.e., what work practices or what capabilities), but also on *where* the change takes place (in what firm, with what tradition and experience), and on *the individuals* involved.

Finally, it is also relevant to refer to a third type of hypothesis, which exists at both the individual and organizational level and is central in practically all the improvement projects that we have analyzed. We call them «business hypotheses», to refer to the particular way in which a given business is understood in the context of a given firm. Such hypotheses tend to be strongly tied to the personal and organizational hypotheses that process innovation programs need to break in order to be effective. They form the «background vision» that inspires individual and organizational behaviour in a firm. When an improvement program needs to break this type of hypothesis, the degree of radicalness involved is very high.

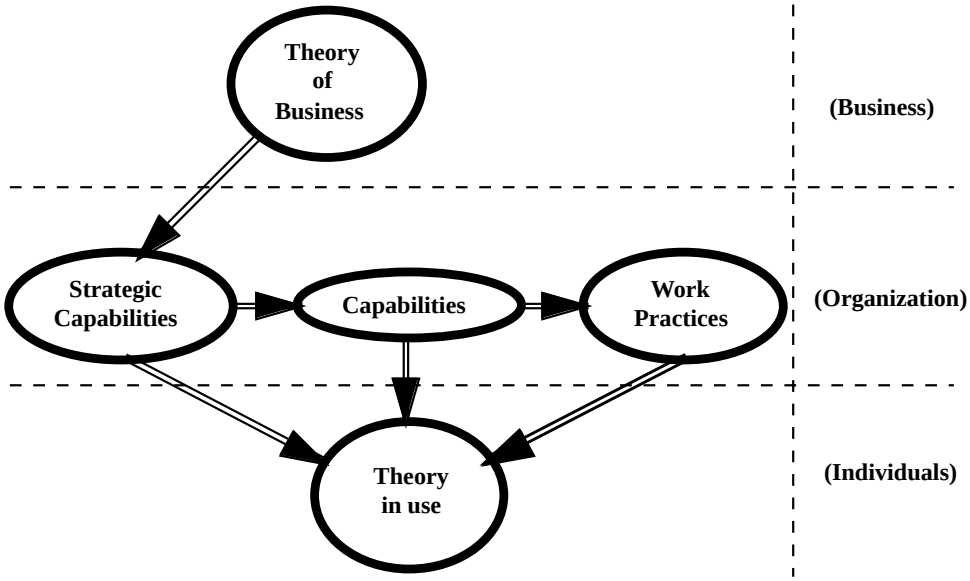
Peter Drucker's [1994] proverbial clear-sightedness shows again when he explains this difficulty. According to him, firms base their activity on three types of (business) hypotheses which rarely change: hypotheses about the firm's environment, about its mission as an organization, and about the distinctive characteristics necessary in order to achieve that mission in that environment. Drucker calls this set of hypotheses the «theory of business» of a firm.

When the firm's business hypotheses are no longer appropriate (for example because changes in the environment render them so), they must be changed. It is necessary to understand why they are inappropriate and to create new ones. This constitutes probably the most radical change of all those discussed so far, as it implies, in fact, «reinventing the firm». It can logically be expected that changes in the business hypotheses will imply changes both in capabilities (in the new firm, the relevant capabilities will also be different) and in work practices, and even in the personal hypotheses adopted by the organization's members. This is why we anticipated that changing the business hypotheses implies an extreme degree of radicalness which sometimes cannot be avoided.

The three learning levels outlined in the preceding paragraphs are not independent of one another. In fact, both individual and organizational learning takes place in a context dominated by the firm's current theory of business at any given point in time. An individual can change his or her personal theory without having to change the current theory of business. Capabilities, even strategic capabilities, can develop and flourish in an organization without a need for changing its current theory of business. Similarly, an individual can change the theory he or she uses without there being an explicit need for a change in capabilities, whereas a change in capabilities will normally require changing the personal theories in use. On the other hand, modifying the theory of business will require, in order for the change to take place effectively, changes not only in the implicit hypotheses behind the individual theories in use, in capabilities and in work practices, but also in their development process. Thus, there is learning involved in any change (be it at the individual, organizational or business level), and the degree of radicalness of the change has to do with how far-reaching (or how difficult) that learning turns out to be.

Figure 4 below depicts the relationships of interdependence between these concepts. The arrows in the Figure mean that «changes in their origin normally imply changes in their destination» (e.g., changes in the theory of business imply changes in strategic capabilities, which in turn imply changes in individual theories in use, and so on, as we have already said).

Figure 4. Implications of changes at different levels

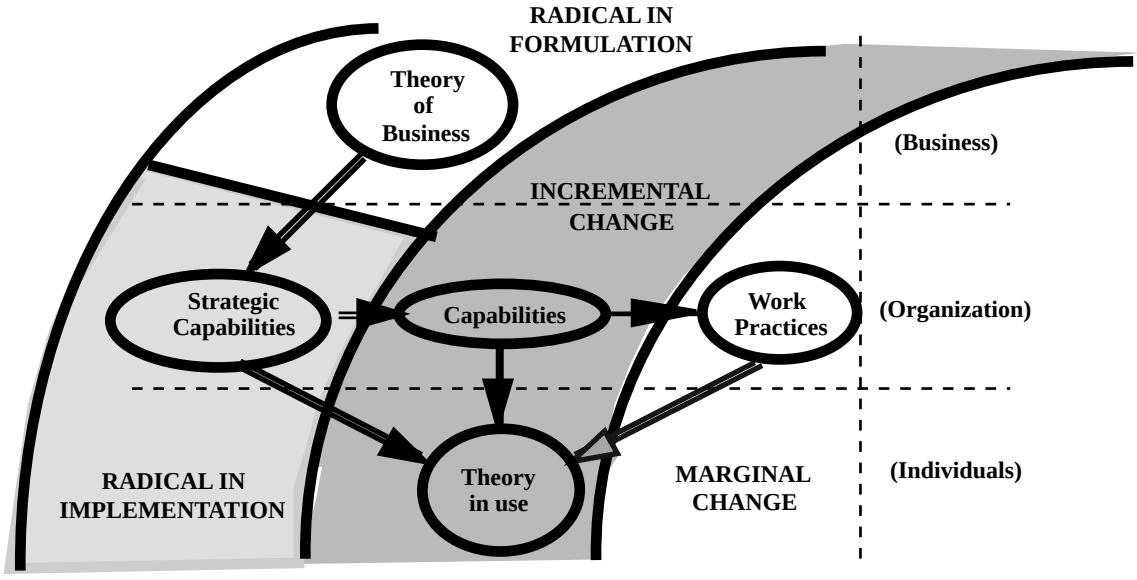


Changes at higher levels imply changes at lower levels, but the reverse is not true

Figure 5 adds «zones» to the scheme of Figure 4 and assigns, from a very general perspective, a degree of radicalness to each of them, by making an explicit general judgement about how arduous the associated learning will usually be.

Most aspects of Figure 5 are self-explanatory. Only one deserves a brief discussion. We have differentiated between two types of «radical change», which we have called «radical in formulation» and «radical in implementation». The former refers to changes in the theory of business; we call it «radical in formulation» because this type of change will normally imply adjustments in the competitive positioning of the firm, that is, it will be necessary to redesign (reformulate) competitive strategy. The latter refers to cases where strategic capabilities change while the theory of business does not –i.e., new, better procedures for competing are identified and implemented in the context of the same unchanged business conception.

Figure 5. Degree of radicalness depending on the learning involved



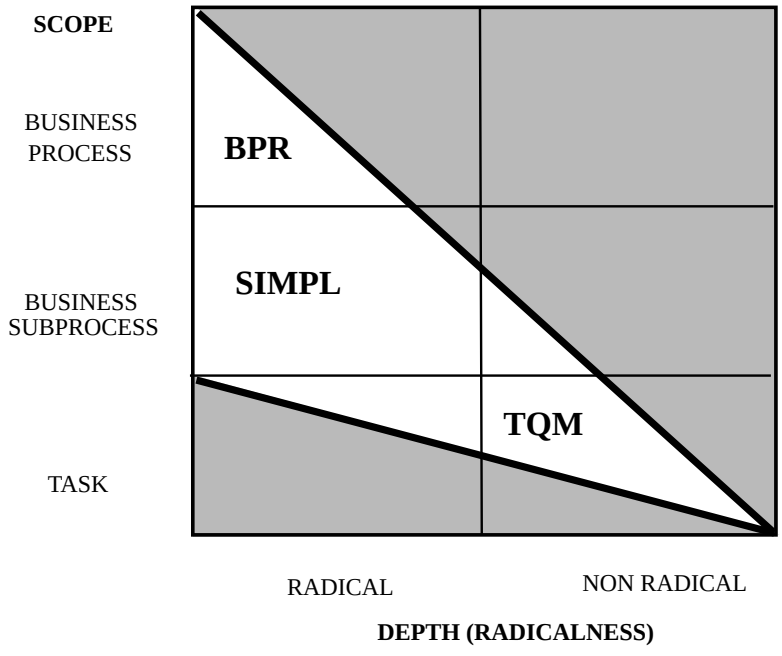
4. Different types of improvement: A conceptual framework

Let us go back to Figure 1, and to the questions posed when describing the research results in Section 2. Remember that we did not find any observations in the «radical - task» area of the figure. Why not? Now, with the concepts introduced in the preceding section, we are in a better position to propose an answer. An explanation, based on Figure 5, is as follows: Improving tasks is very close to changing work practices, which implies the least demanding of the types of learning implicit in Figure 3 –that is, it implies non-radical changes «by nature». In other words, at the task level, the radicalness concept almost disappears and there is no radicalness to speak of. The failure to be radical by nature lies at the root of a definite danger for companies that, in order to improve at the business process level, start by breaking the processes down into simpler parts and trying to improve each one of them separately. Eventually, this makes radical change impossible, and inevitably leads only to incremental improvements. A few of the cases studied illustrated this situation.

In Figure 1 we did not observe any cases in the «business process –non-radical» area, either. Why not? From the perspective of Figure 5, changing business processes involves at least changing capabilities, and often strategic capabilities (sometimes even the theory of business needs to be changed). The learning involved is of such a calibre that calling it non-radical is not appropriate. This is why the improvement projects which score high in the vertical axis of Figure 1 tend to be radical. In other words, not being radical at those levels is practically impossible –if you try to be non-radical, chances are that you will end up at lower levels in the vertical axis of Figure 1. If we plan to improve incrementally, we will find ourselves improving tasks rather than business processes; in order to avoid being radical, we will tend to break processes down into tasks, and operate at the task level. This way of proceeding is entirely consistent with Total Quality Management initiatives: they look for continuous small improvements by decomposing processes into tasks. In summary, we are unlikely to find examples located in the Northeast and Southwest areas of Figure 1 because of the nature of the changes involved.

An implication of the preceding discussion is that the conceptual framework of Figure 1 is better represented through a triangle, such as that in Figure 6 below. The scheme in Figure 6 is the framework we propose for the purpose of classifying, understanding,

Figure 6. The proposed conceptual framework



analyzing and planning change and innovation in the firm. It shows how radical change applies to BPR (1), while non-radical improvements belong rather to the realm of TQM.

An interesting feature of the scheme in Figure 6 is that it contains a *natural slope which takes you naturally (by inertia, as it were) to non-radical improvements*. That is, *maintaining* a radical focus on an innovation project requires explicit effort, as a direct consequence of the learning processes involved, both individual and organizational. This explains why process innovation requires specific methodologies to help the work team in the task of breaking pre-established hypotheses.

From the perspective of the framework in Figure 6 it is interesting to note that many of the cases we studied tried to arrive at process innovation or BPR through simplification and quality improvement programs. While it is true that quality improvement changes are a powerful lever to initiate process-based and client-focused thinking, and to start putting emphasis on measuring results, arriving at the true spirit of radical process innovation or BPR requires a sizeable qualitative jump, which does not happen spontaneously. It needs specific actions and, consequently, specific methodologies and training, different from those used in continuous improvement programs such as TQM. It is not at all clear that the need for this change in approach was anticipated by the managers of the companies we studied in our research project.

On the basis of the preceding discussion, it is possible to foresee the kinds of specific action that are needed in order to achieve radical improvements. There are *actions at the individual level*, aimed at preventing as far as possible the blocking of individual learning that tends to occur naturally at that level; *actions at the organizational level* to make sure that the context in which the necessary learning takes place is well known and understood by the individuals and groups who will eventually be the repositories of new organizational capabilities; and also actions geared at facilitating the generation of new ideas that may challenge the *theory of business in use* in a specific firm at a given point in time.

The goals of all these actions are so ambitious that it is practically impossible to achieve them simply by setting generic objectives in the organization and waiting for the actions to occur spontaneously. What might be called «acts of force» may be needed, mainly in the *conception* of radical changes if they are to be genuinely radical. A different matter is the *implementation* of the changes, once conceived or designed. In order for the implementation to be effective, imposing new practices is not sufficient; it is necessary to convince people and to make sure that the appropriate learning is present at all levels.

5. Conclusion: Implementation and the need for a holistic view

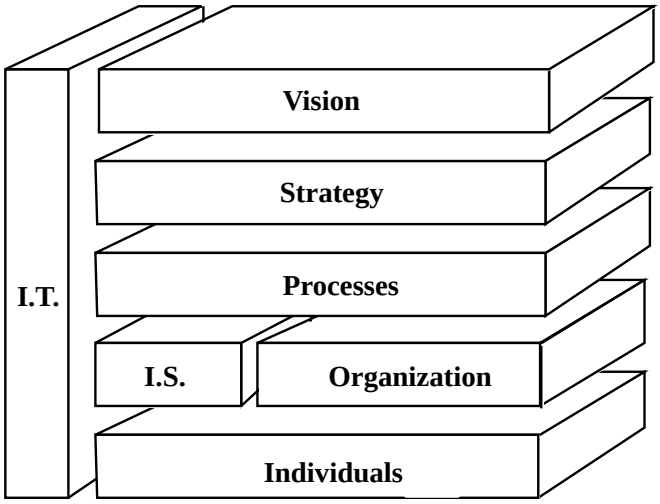
The concepts in Figures 4 and 5 are also of interest in the implementation of change programs. It is precisely during implementation that the different types of learning must occur in order for the changes to take place effectively. Thus, all the elements involved in the necessary learning processes must be taken explicitly into account during implementation. Individuals, organization, competitive outlook and positioning, theories of business or business vision and, of course, business processes. None of these issues is independent of the

(1) One could also define a higher level of scope, «reinventing business», by considering processes in the value systems outside the firm's environment.

others, and their multiple interrelationships open up various possibilities for organizing the implementation of a change project.

Figure 7 depicts the basic elements to be taken into account during the implementation of a change program and suggests the interrelationships among them. The structure of the figure is worth considering in some detail. Starting at the central component, «processes», which is a fundamental element of discussion in this article, we include elements above and below it. Above it we include «(business) strategy» and «(business) vision». By now, the reasons for including both these elements are clear: Radical changes in business processes as understood in this paper may imply reconsidering the firm's strategy, and thus these two concepts are not independent. Further, the concept of vision is also relevant because changes may be needed in the business conception itself, mainly when changes in *business hypotheses* are involved.

Figure 7. Different elements relevant in change program implementation



Below «processes» we include, first, «organization» and «information system (IS)» at the same level, and below them, the first supporting element: «individuals». Organization and IS are at the same level because the firm's IS is, from a conceptual standpoint, the other side of the coin of organizational structure: a given structure always implies an IS capable of facilitating access to the information needed for decision-making at each level of responsibility of the structure. Thus, it is impossible to talk about changes in organization without envisaging changes in the IS, and vice versa. Finally, the reason for including the «individuals» block is clear, as individuals and groups must learn in order to make a change program really effective. Also, individuals are responsible for the tasks that have to be modified or even eliminated, and they are the ones who create and consolidate work practices and capabilities, be they strategic or otherwise.

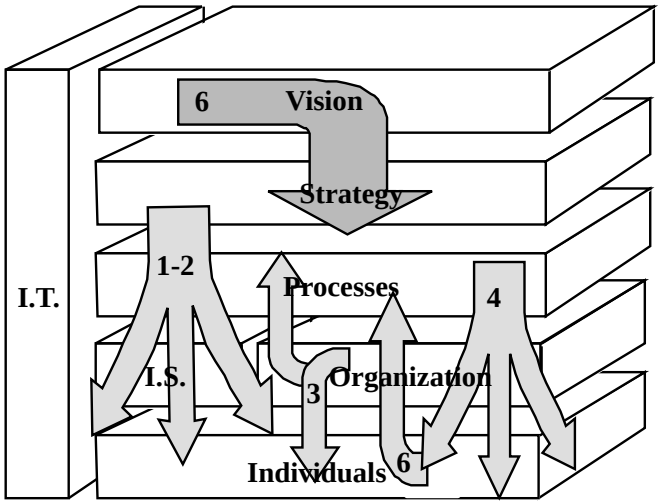
The framework also shows the enabler role played by information technologies (IT), in a vertical block, to convey the idea that they may affect any of the levels in the Figure, directly or indirectly.

From the implementation perspective that we are concerned with here, it is important to note that any radical change program must bear in mind all of the interrelationships among the elements in Figure 7. At least from a theoretical standpoint, this

implies starting from a clear business vision and with sufficient strategic flexibility to take advantage of new opportunities brought about by the new capabilities resulting from the improvement process. In other words, it is a matter of being able to take advantage of the learning that is generated. A consequence is the need to conceive the improvement program in the context of a strategic framework, without overlooking the associated organizational implications.

When the cases we used in our research are analyzed in the light of Figure 7, the conclusion is that a change program can be implemented in several different ways, as long as all the dimensions in Figure 7 are kept well coordinated. For example, a firm may find it appropriate to start by implementing changes in the organizational structure area, or in the strategy area, or even in two areas simultaneously. In fact, we detected almost every possible combination in the cases studied, depending on what was judged relevant in the background of each firm in terms of the kind of learning involved, who would have to undertake it, their previous experience, and so on. Thus, there seem to be what could be called different «implementation tactics», which are much more organization dependent than the design of the corresponding change program. A few of the tactics observed in the firms we studied are shown in Figure 8, using the framework of Figure 7.

Figure 8. Different «implementation tactics» observed



Companies: 1. Commercial bank, 2. Insurance company, 3. Automobile parts manufacturer, 4. Producer and distributor of fresh products, 6.Pharmaceutical company.

Coming thus to a conclusion, we can say that the process innovation paradigm, which has become very popular in management literature and practice after the pioneering work of Hammer, Champy and Davenport, has been proven to go well beyond designing and implementing radical changes in some «boxes» called «business processes». In particular, we have argued in this paper that there is no process innovation program without organizational implications, many of which can be understood with concepts of learning at the different levels: business, organization, and individual.

The concept of radicalness can be stated in terms of how hard the learning turns out to be, which depends not only on the innovation itself, but on the context in which it is meant to take place, that is, the organizational environment. Further, one important implication is that unless a specific effort is put into the change process, the result is not going to be radical

change. There is a «natural slope» that tends to make spontaneous improvement efforts non-radical. This is due not only to the fact that being radical in itself requires paying specific attention, but also to the fact that maintaining a focus on business processes (rather than on tasks, for example) also requires new, traditionally uncommon, attitudes.

There is no change program without organizational implications, although these implications can take very different forms, depending upon the starting point and the idiosyncrasy of each organization; therefore, a more holistic approach to BPR is needed. In the end, radical process improvement always implies changes in personal attitudes at all levels, moving the organization towards new management models.

References

Andreu, R. and C. Ciborra, «The Role of IT in Creating an Effective Knowledge Base for the Learning Organization», *European Forum for Management Development (EFMD) Review*, EFMD Forum 95/1.

Andreu, R., J.E. Ricart and J. Valor, *La Organización en la Era de la Información: Aprendizaje, Innovación y Cambio*, Estudios y Ediciones IESE, Barcelona, 1995.

Apte, Uday M. and Charles C. Reynolds, «Quality Management at Kentucky Fried Chicken», *Interfaces* 25:3, May - June 1995.

Argyris, C., «Teaching Smart People How To Learn», *Harvard Business Review*, 1991.

Ballou, Roger H., «Reengineering at American Express: The Travel Services Group's Work in Process», *Interfaces* 25:3, May - June 1995.

Brynjolfsson, E. and L. Hitt, «Is Information Systems Spending Productive? New Evidence and New Results», ICIS Conference, Orlando, Florida, 1993.

Champy, J., *Reengineering Management*, Harper Business, 1995.

Crosby, P.B., *Quality is Free*, McGraw-Hill, 1979.

Davenport, Thomas H., *Process Innovation: reengineering work through information technology*, Harvard Business School Press, 1993.

Davenport, T.H. and J.E. Short, «The New Industrial Engineering: Information Technology and Business Process Redesign», *Sloan Management Review*, Summer 1990.

Davenport, T., an interview by J. Watts in *Business Change & Re-engineering*, Vol. 2, No. 1, 1994.

Deming, W.E., «Report to Management», *Quality Progress*, 1972

Drucker, P., «The Theory of Business», *Harvard Business Review*, 1994.

Hammer, M., «Reengineering Work: Don't Automate, Obliterate», *Harvard Business Review*, July-August 1990.

Hammer, M. and J. Champy, *Reengineering the Corporation*, Nicholas Brealy Pub., London, 1993.

International Management, CSC Index and Dataquest Europe. «A Monthly Look at Europe's Latest Figures - Including Some Unusual Statistics», September 1994, p. 62.

Juran, J.M., *Juran on Quality Design*, The Free Press, 1992.

Pérez-López, J.A., *Fundamentos de la Dirección de Empresas*, Ediciones Rialp, 1993.

Rockart, J.F. and J.E. Short, «IT in the 1990s: Managing Organizational Interdependence», *Sloan Management Review*, Winter 1989.

Watts, J. (a): «The future of BPR», *Business Change & Re-engineering*, Vol. 2, No. 3, 1995.

Watts, J. (b): «An Introduction to Holistic BPR, *Business Change & Re-engineering*, Vol. 2, No. 4, 1995.