# TRANS-DISCIPLINARY KNOWLEDGE BUILDING DURING PROJECT INITIATION: A TOOL FOR DECISION MAKING, THE EPASE EXAMPLE IN ST-ÉTIENNE, FRANCE

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## Abstract

**The project structure "Établissement Public d'Aménagement" (EPA), conceived and operated by the French government as a powerful intervention tool for large scale urban renewal, overpowers the traditional project management process by offering otherwise unavailable resources and expertise at the regional level.**

**The opportunity for local actors to participate in the process of the urban renewal of Saint-Étienne (France) was achieved through a multidisciplinary research group that was established to document, support, and feed the endeavour through a wide array of projects and workshops including interventions in architecture, urbanism, landscape, and transportation.**

**One specific aim was to develop a common body of shareable trans-disciplinary knowledge amongst actors and stakeholders (AS) by implementing and testing the project-grounded research methodology, thus confronting a participatory research protocol within a large scale renewal project. In the process, the transdisciplinary views of decision makers and stakeholders were modelled through qualitative analysis of workshops and interviews. The analysis offers an insight into the relations between actors and stakeholders at varying stages.**

**However, the scope of the intervention and the complexity of issues make it virtually impossible for all stakeholders to be involved or even be considered in the process. The research shows that despite their complexity, such projects benefit from the involvement of stakeholders as long as they are considered an integral part of the project and the solutions put forward, from the project's initiation. It highlights the limits and mostly the benefits of the project-grounded research approach through the mix and interaction of multiple AS.**

**Keywords:** Stakeholder participation; Project process; Exploratory project-research; Transdisciplinarity; Design thinking

## Introduction

This research project brought together political and institutional sponsors, researchers from various universities and research laboratories, public resource centers, private partners and professional firms as well as artists, designers, and other collaborators with specific interests in the Urban Renewal project. In an effort to monitor the proper set of issues before and during the project, all actors and stakeholders were also involved in the design of the research protocol itself, under the "Art, Architecture, Paysage" (AAP) research program.

Even though situated in a developed country, many consider the Saint-Étienne Region to be a devastated area as a result of post-industrial economic depression. The remnants of the industrial era that collapsed in the eighties stand in the landscape over a region that stretches for more than eighty kilometres between Lyon and Firminy.

Saint-Étienne was the first industrial city in France. Nestled on the Furan River, the city lies between two major rivers, the Rhône which flows to the Mediterranean Sea and the Loire that connects to the Atlantic. Strategically positioned, the high quality coal and pure water made the region an ideal location for the development of the steel industry in an area which was already famous for its gunsmiths. Other specialties included refined and renowned lace-makers, as well as being the cradle of the bicycle industry. Once bustling with manufactures and filled with highly skilled artisans, the region suffered tremendously from the total collapse of its industries, not to mention the “exodus” of large portions of the young workforce. It was left in abandon for decades.

The region has suffered greatly in the past decades. Particularly where the industries collapsed, leaving this otherwise potentially scenic region littered with abandoned and highly contaminated industrial sites, all along an eighty kilometre stretch of the valley between Firminy and Lyon. The whole region was therefore tagged for a substantial rehabilitation. In this context it is crucial to appreciate the interweaving nature of agricultural, industrial, urban, and natural fabrics of the region. The historic, cultural, and industrial heritages are also part of the complex problematic of reviving the whole region.

Small communities and municipalities of the region have tried to overcome some problems by initiating individual sporadic projects but the magnitude of the task proved too great for them to complete the upgrading of transportation infrastructures, the decontamination of industrial sites, and the revitalization of complete urban housing sectors which are amongst the most pressing issues. Therefore, additional expertise, as well as new legislation, was needed in order to initiate, develop, and manage the project. It takes shape in the “EPA” or “Établissement Public d’Aménagement’ (RF, 2007).

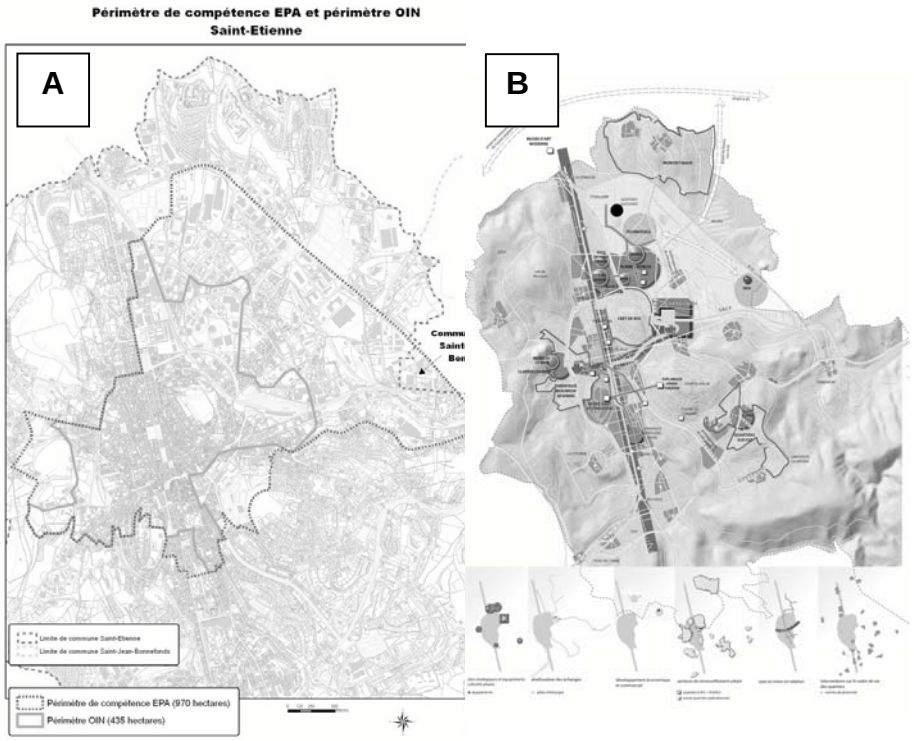


**Fig. 1.** City of St-Étienne and EPA boundaries (A) and nature of planed interventions within the EPA (B). (Source: Ville de St- Étienne, Direction de l’Urbanisme :EPASE)

The apparent fragmented tissue of the region is comprised of very dense urban centers mixed with abandoned and contaminated old industrial sites. These sites, besides having a considerable heritage value, offer great opportunities for rehabilitation (Peyre & Kleinefen, 2006). Unfortunately, the stigma carved in people's perception by the collapse of the once prosperous industries renders it difficult for promoters to stimulate the adoption of novel concepts needed to revitalize these sites. Furthermore, the size of some sites, not to mention their degree of contamination, makes it even more difficult to justify their redevelopment, from an economic perspective. Being mainly literally in the center of towns and built along the rivers (and in many cases covering them), they occupy prime real estate. Many inhabitants would simply rather see all these infrastructures that carry bad memories, than if they were simply levelled.

The strategic value of the Lyon/Saint-Étienne region has for long been identified by the government, even if not so much openly admitted until recently, and since the region was so dramatically impoverished in the past three decades, the government had to intervene. A long process of devising a proper plan was then put in motion at the request of what is called a "Commune of communes": a grouping of regional political subdivisions.

SEQ. (A) above indicates the area of intervention; and (B) their nature and specific location within the EPA boundaries. The intervention includes, in order of the small icons at the bottom of Figure 1. (B): strategic and cultural sites, transportation, economic and commercial development, urban renewal sectors, main strategic axis, and specific neighbourhood living environment interventions. The project, officially initiated by decree in early 2007, will span fifteen years in multiple phases and involve more than 850M Euros, half of which comes from the public sector.

## Theoretical and operational concepts

Although the research was conducted in a multidisciplinary setting, specific concepts based on a design thinking perspective were adopted and used for the implementation of the protocol (see research method) and the following discussion. These concepts are briefly presented to inform the reader. Design thinking refers to the multifaceted nature of the design activity(Lawson, 1980; Rowe, 1987; Cross, Christiaans & Dorst, 1996; Gedenryd, 1998; Boland & Collopy, 2004; Owen, 2007): iterative, solution driven, systemic vision, synthesis versus analytic, human-centered, adaptability, ability to visualize and visual communication, etc. Design management refers to the still emerging discipline that focuses on the management of the design activity, seen as a function variable/service within the project process. Management by design introduces the design thinking approach to project management as an alternative to information processing decision making, thus introducing a 'solution driven' approach instead of a 'problem solving' one. The organized project refers to the mechanist, structured, planned, and linear nature of traditional project management models. Finally, the project as an organizing process refers to a more complex concept based on Boutinet's (2004) project theory, as well as Le Moigne's (1984; 1999) general systems theory and Morin's (1977; 1996; Morin & Lemoigne, 1999) complexity theory. We establish here that the project, as much as it can be planned, organized, and structured prior to its actual initiation and realization, is also submitted to a dynamic self-structuring process. This process is driven by the actors and stakeholders (AS) actions, as well as by intangible context specific variables and uncertainty situations.

## Conflicts of traditions: architecture within urbanism

Considering this context, it was of interest to observe the implementation of the EPA approach and structure along and within the traditional established route. The legislation which guides large scale project expanding over multiple communes revolves around a series of measures that have been devised over the past forty years (see **Erreur ! Source du renvoi introuvable.**). They are

mainly devised around Urbanism legislation and guidelines, thus driving the entire synergy of urban development. Every project has to follow these numerous guidelines and be extremely well integrated as much economically, culturally, and socially (to name just a few dimensions). Consequently, architecture and construction are strongly dependant, if not restricted, by urban legislation. The establishment of the EPA structure for large urban renewal projects is therefore devised as a means to sidetrack traditional structures and bureaucratic impediment. Furthermore, it allows the inexperienced small communities to seek and acquire a considerable and essential body of expertise and resources otherwise unavailable.

Modeling the procurement route, through "actor-stakeholder participation" (ASP) within the "project-grounded" research protocol (Findeli, 2004; de Blois, 2007; Findeli, Brouillet, Martin et al., 2008), was a secondary objective of the main AAP research. It was added during the qualitative analysis phase of the workshops as a complementary tool to better understand the dynamic of ASP, as well as to support the positioning and structuring of the multi-disciplinary knowledge data base. This data base was then subsequently reintroduced in a second round of workshops. The exercise proved very productive in the identification of other AS and their inclusion in the project process. The project structure (the multi-organisation) clearly identified the "fuzziness" of the pressure points between the traditional structure of the project: actors associated with the decision process and liability issues; and the proposed alternative of early ASP, which introduced actors and stakeholders (AS's) with little or no direct and formal decision power and/or influence over the global process and general orientation of the multiple projects.

The convergence of "bottom-up" (project initiation by local individual stakeholders) and "top-down" (governmental and politically driven) strategies, allowed the deployment of crucial guidelines that were to be included in the project specifications. The workshops were devised as tests beds for these newly incorporated scenarios from various AS.

The confrontation between formal participants (sponsors, institutional, and private actors) and informal ones(researchers, pressure groups, political, and individual stakeholders) in the early stages allowed the identification of potential conflicts, often discarded by traditional actors (legislators, promoters, contractors, individual pressure groups, etc.). The workshops, supported by formal visual material, allowed all participants to develop the so called "shared understanding" of issues around a common terminology associated with concrete concepts (models, maps, animation, artistic creations, etc.). They also highlighted the difficulties in bringing together multiple organizational structures.

Originally, the modeling of the traditional procurement route of urban renewal projects was to serve as a study of AS dynamic. Modeling the (multi)organisational structures came as a second objective. Respective roles are essentially determined by a complex body of legislations, regulations, and principles, devised at the national, regional, and local levels as shown in Table 1. With the introduction of the exceptional EPA state intervention tool, rupture points were to be anticipated.

The imbricated cohesion of measures devised over the past forty years, in order to properly assure the integrated development of regions, takes into consideration economic, social, cultural, heritage, historic specificities, at the macro as well as the micro scales. The AAP research report (Coste, Findeli, Guillot et al., 2008) gives an evocative picture of the evolution and depth to how these measures were devised and implemented.

**Table 2.** Urban Renewal: Institutions, Laws, and Regulations overview

**Document d'Urbanisme et lois**

| | | | | |
|---|---|---|---|---|
| Code de l'Urbanisme | | - 2008 | National | http://www.legifrance.gouv.fr/ |
| Plan d'occupation des sols | POS | 1967-1983 | National | Foncier: voir LOF |
| Loi d'orientation Foncière | LOF | 1967 | National | Foncier |
| Schémas Directeurs d 'Aménagement et d'Urbanisme | SDAU | 1983 | Supracommunal | Urbanisme , remplacé par les SCoT |
| Directive Territoriale d 'Aménagement | DTA | 1995 | État | Outil juridique : Aménagement du Territoire et Urbamisme |
| Règlement National d 'Urbanisme | RNU | 1997 | National | Urbanisme et environnement |
| Loi d'orientation pour l 'aménagement et le développement durable des territoire | LOADDT | 1995-1999 | Inter-territorial, agglomération | Territoire , aménagement et développement durable |
| Plan Local d'Urbanisme | PLU | 2000 | Communal et inter-communal | Remplace les POS |
| Solidarité et renouvellement Urbain | SRU | 2000 | National et communal | Urbanisme , habitat et déplacements . |

**Programmes et Plans**

| | | | | |
|---|---|---|---|---|
| Programme national de rénovation urbaine | PNRU | 2003 | National | http://www.anru.fr/PNRU.html |
| Projet d 'Aménagement et de Développement Durable | PADD | | Orientation générale de la commune | Conjoint au PLU et au SCOT |
| Schéma Cohérent d 'Organisation Territorial | SCOT | | Communes et Groupement de communes, Agglomération | Remplace les SDAU |
| Agenda 21 | | 1992 | Interrnational | Sustainable Development |

**Institutions**

| | | | | |
|---|---|---|---|---|
| Etablissement Public de Coopération Intercommunale | EPCI | 1999 | Intercommunal | Structure administrative |
| Agence Nationale pour la Rénovation Urbaine | ANRU | 2003 | National | |
| Direction de l'Environnement | DIREN | | National et communal | Aménagement de Territoires référents |
| EPURES | | | Régional | Agence d'urbanisme |
| Établissement public foncier | EPORA | | État | Réhabilitation foncière |
| Établissement public d 'aménagement | EPA | | État | Outil juridique et structure administrative |

The EPA, even though it was initiated at the regional level in this case, grants its existence only due to the intervention of the state. The legislation (and constitution acts) explains clearly its powers and potential scope of intervention (RF, 2007). Its nature also highlights the shortcomings of the traditional legal and political structures in dealing with complex projects, as they present a considerable obstacle (mainly bureaucratic red tape) to drastic intervention that mobilize considerable resources. As stated, the EPA has the power to bypass, if wanted and mostly if necessary, the traditional processes.

## Research methods

The process involved gathering and mapping information about: (i) the project structure, the research group structure and communication channels (formal and informal); (ii)the identification of each organization responsible (or the most influential); (iii)each organization's field of expertise; each individual's respective discipline and finally each individual's motivations (professional, personal, or ethical) towards the project.

An array of qualitative methods are adopted for this exploratory project into ASP at project initiation. The "project grounded" research (PGR) method (Findeli, 2004; Findeli & Coste, 2007; Findeli, Brouillet et al., 2008) was adopted (since there is an active debate over the validity of this method, it is suggested that the reader consult the references for more information). The method focuses mainly on generating relevant knowledge that contributes to the improvement of design practice. As Findeli et al.(2008) puts it, PGR focuses on research through design, thus making the difference between research for design (technology, ergonomic, aesthetic, psychological, etc)

or about design (its objects, its processes, its actors and stakeholders, its meaning for society, etc., mainly conducted by other disciplines for their own benefit). PGR focuses on the relevance of results (for knowledge, for practice, for education) for the advancement of the design discipline. In our case “design” is an integrated activity throughout the built environment project process. It implies a look and a critique of design management, which traditionally corresponds to the management and control of all the conception activities, but only between the feasibility and construction phases.

The approach implements a procedure for multidisciplinary problem setting (Rittel & Webber, 1973; Coyne, 2005) as opposed to problem solving, through shared understanding of stakes. It implies also the design of a mixed method protocol. The main driver consists of applying “design process and methods” into ASP by conducting small workshops within actual projects. The participation of researchers from various fields brought together an array of various and conflicting methods which had to be modulated in order to produce a consensus with regards to the validity of results. “Project-grounded” research calls for the conduct of participatory action research methods, adopting a “grounded theory” posture using ethnomethodology’s interpretation, all within a case study framework. This unique mix assembles a proper tool set of methods specially adapted for problem setting and multi-disciplinary design research.

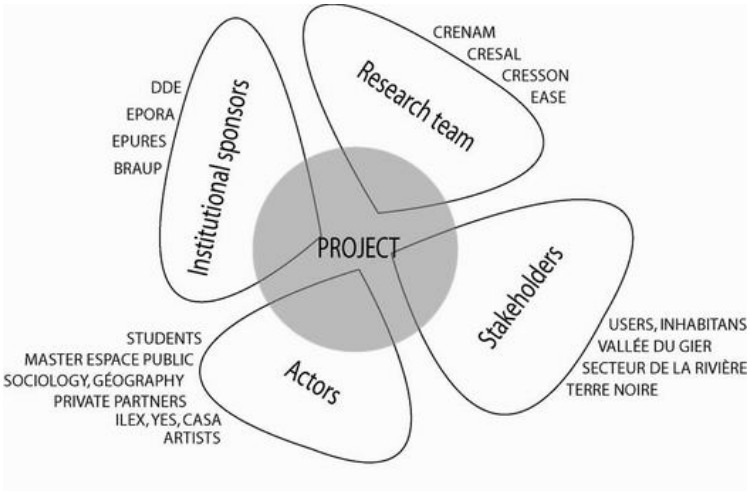


**Fig. 2.** Actors-Stakeholders within the research team at project initiation

Conducted over a period of two years, the “Art, Architecture, et Paysage” (AAP) research project covered a wide range of objectives in each field of expertise stated above. Design process and ASP within the EPASE (Établissement Public d’Aménagement de Saint-Étienne) were used to (i) model and compare the organizational structure of the research team endeavour with the EPASE and (ii) demonstrate the evolution of roles of AS throughout the project process.

A qualitative analysis of case studies was conducted based on the material extracted from the “grounded theory” section of the study, conducted during the workshops. It was then processed and filtered a second time through Atlas.ti (Atlas.ti, 2007) to generate the multi-disciplinary material (terminology, concepts, issues) needed for the second round of workshops. The second round of workshops was to serve as the basis for actual project programming.

The qualitative case study analysis was also used as a complementary tool for: modeling informal organizational structures, based on the theories Mintzberg (1979; 1983) and for producing a map of AS dynamics. Informal and semi-structured interviews were necessary to complete the mapping, originally assembled from formal data collected from various document sources (reports, charts, websites, etc.). To better understand the dynamic of AS, each interviewed

individual was categorized using a double system aimed at identifying disciplinary hegemony within the project structure. The first categorization identified individual's academic and professional affiliation. They were sorted by project disciplines. The second one wished to identify the "hidden agendas" of AS by identifying all other interests that might influence their official duties assigned though their role in a specific project, such as personal interest, ethical concerns, political affiliation, cultural history, etc.

**Research question and hypothesis:**

- How can "Project-grounded" research contribute to the generation of trans-disciplinary "knowledge" for decision makers at project initiation.
- The project structure of the temporary multi-organisation is affected by both traditional disciplines as well as by AS intentions and evolving roles that are not formalized in legal and contractual documents.

This hypothesis aims to establish the potential strategic role of design, as one of the first steps of project initiation, and then to examine the scope of the practice of design, to finally clarify the potential role of design within the context of the building industry. It is partly supported by a discussion of the organizational structures of projects of the building industry and the model of project management illustrated by the 'Process Protocol' (Kagioglou, Cooper, Aouad et al., 2000). Design practice and project behavior are studied from the viewpoint of the respective positions of the actors-stakeholders (disciplinary positions, intentions, and roles) on the one hand (Crozier & Friedberg, 1977; Abbott, 1988), and the organizational concepts and structures of the project on the other (Mintzberg, 1979; Boutinet, 2004; 2005). The goal is not to explore methodologies aimed at improving the design process. Instead the study proposes a confrontation of the traditional sequential and linear approaches of project management by exploring the real foundations that drive and maintain change through the development of the project. (Boland & Collopy, 2004) This includes the AS and their intentions: think, do, and act (*"penser", "faire", "agir")*, uncertainty anticipation, and management. All of which affect the choice of procurement strategies in complex projects involving a wide variety of scales.

**Research Objectives:**

- Compare the traditional approach to project development (as an organized project) with the project as an organizing process through ASP;
- Implement and test the "project-grounded" research methodology;
- Identify, qualify, and model the AS role evolution, within a multidisciplinary research team; and
- Implement a computer qualitative research tool (Atlas.ti) as a knowledge base for developing a "shared understanding" of issues at project initiation.

The research protocol, conceived to implement workshops on the "participatory action research" format wished to emulate a red tape free environment aimed at observing how AS (i) define their "problem space" and (ii) reach a common agreement on sensitive conceptual issues as opposed to "feasibility" ones. As project managers are increasingly leaning towards "design management" approaches, it is pertinent to analyze how they are implemented and how they actually perform.

## Research results

The results stress the limitations of “design methods” (Broadbent, 1969; Jones, 1970; Alexander, 1971; Lawson, 1980 in Gedenryd, 1998, p. 59) for problem solving. In fact, these methods were repudiated by the same authors that devised them. This raises questions about their adoption by the management sciences that use them as a tool for understanding and devising complex structures and processes to better manage the project process. Understanding and managing the design process based on management principles that rely on inadequate design methodologies seems, in that matter, contradictory. *“The usual difficulty is that of loosing control of the design situation once one is committed to a systematic procedure which seems to fit the problem less and less as designing proceeds.* (Jones, 1970 in Gedenryd, 1998) Nevertheless, design management takes that route and seems not to consider the challenges the understanding of design poses: “*In studying design as a process, one is looking at the process-component of largely content-based decisions. This severely limits the power of a process-oriented methodology to understand what is going on in the design activity.”* (Dorst & Dijkhuis, 1995)

In contrast to the rigid and fragmented processes of project management, the thinking *by* design postulates that the conception of design spaces allows for an approach that is both global and specific for the project and its components, its intentions, and its purposes. To that end, it is also assumed that the iterative characteristics of the design activity towards problem definition, the approach from the whole and the parts, the premise of the complexity of the problem, and the mechanisms for decision making, are all essential elements as much to the project control as to the design process. Consequently, the two processes (problem solving and designing) share noticeable similarities. However, these similarities are not always reflected in practice. It is therefore possible to offer alternatives to current methods of problem-solving by a reversal towards *problem-setting*?

The research allowed for a comparison of traditional procurement methods with the EPA strategy. It highlights the potential disturbances that such a choice initiates. Even though it was clear form the outset of the project that the expertise for such large scale endeavours was not present at the regional level (municipal and departmental), it seemed difficult for local stakeholders to justify such a radical approach. The intervention is limited to a very specific territory and does not take into account all the issues that were identified by the research team and AS, although a whole region was identified by the problematic. While it is utopian to think that all AS involvement is possible, the research clearly identified the important links that certain interventions would have on neighbouring communities and the necessity to include as many as possible in the early phases.

It was found that complex projects of this nature would gain if approached in a more holistic perspective. The territorial boundaries of the intervention though, in this particular case, greatly limit the potential impact of the measures initially identified within the research. The research considered the whole valley all along the highway infrastructure, linking multiple communities. The EPA intervention is concentrated on a specific perimeter in Saint-Étienne, as shown in Figure 1.

The research protocol, which aimed at testing the “project-grounded” research method, proved incomplete when evaluated against more traditional methods. It is difficult to implement as a trans-disciplinary tool for knowledge building as the actors do not even share the same understanding of what transdisciplinarity really is. At first glance, the methodology is labour intensive and time consuming but it has the big advantage of being very close in nature to a participatory approach.

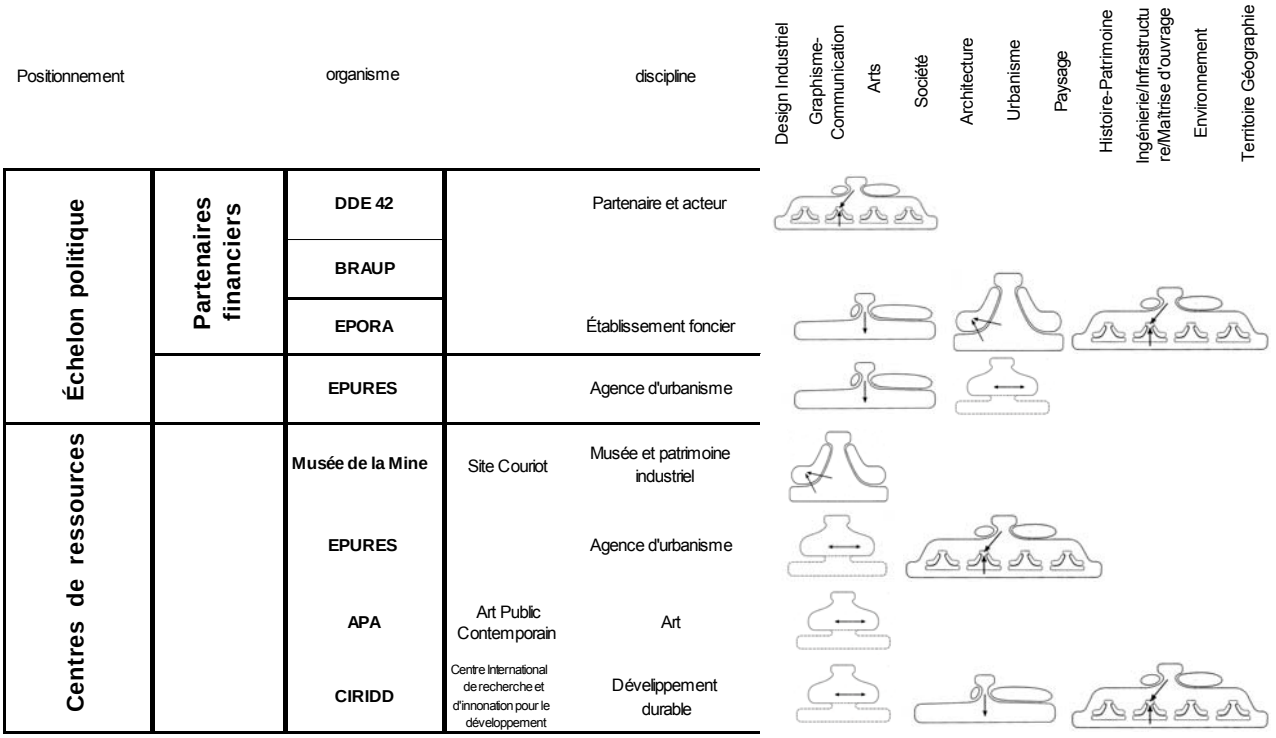


**Figure 3.** Partial map of Mintzberg's organizational typology of actors

Studying the project as a "system" as opposed as an object, allowed the research team to identify issues that would not have revealed themselves with traditional methods. The inclusion of formal user knowledge also helped bridge the gap between disciplines, as everyone had to emulate vocabularies and meaning.

It was shown that other interests of AS were strong indicators of potential stakeholders collaboration or confrontation; that common affiliation suggests the concentration of power within traditional disciplines; that AS dynamic mapping (formal and informal) allows for a better understanding of project structure and consequently helps to probe, evaluate, and anticipate certain risk and uncertainty situations

## Discussion and conclusions

Decision makers do not always define the scope problem that they have to deal with. Often, the process of developing a shared understanding is not an integral part of their practice. The traditional institutionalized mechanist segmented approach is by nature multi-disciplinary, where each specialty addresses its own problems and issues within their respective expertise. The holistic nature of the proposed approach asks, at a minimum, to be inter-disciplinary. Instead of looking at separate "elements" constitutive of the whole, the research focused on formalizing "relations" in between disciplinary knowledge and AS. As the AAP report shows (Coste, Findeli *et al.*, 2008), the workshop protocols are resource intensive and logistically complex to coordinate within a real project scenario. Furthermore, a thorough qualitative content analysis (with Atlas,ti; (Atlas.ti, 2007) of the workshops (audio, video, and other visual material (de Blois, 2007; Coste, Findeli *et al.*, 2008)) is essential for results validity. In this case, time constraints, protocol inconsistencies, and methodological fine tuning produced limited, although promising, results.

**Key Lessons Learned:**

- Procurement of EPAs (RF, 2007) sidetracks the normal established course of action by establishing it's own rules (and legal tools) for intervention;
- Partnerships at the national and international level are crucial, local knowledge and expertise in procurement capacity is not necessarily requested by contracting owners;
- Established procurement routes are affected by local AS intervention within the EPA.
- The project-grounded methodology tends to demonstrate the existence of the "cohering project" concept.
- Results achieved by stakeholders intervention has, in fact, limited effect on the traditional procurement initiation established and guided by the urban laws and practice

Although the results, obtained with the "project-grounded" research protocol are exploratory and preliminary, they indicate that flexible adaptable project structures, developed collaboratively for specific projects while taking into consideration the potentially evolving roles of AS, contribute to a better project initiation process.

The comprehension and the description of multi-level project behavior systems (interactions of subprojects within the main project as seen though ASP) are essential in this context. They are usually described with specific procedural models that do not allow for the grasp of the entire complexity of the issues. Design thinking can play a decisive role by strategically embedding itself within organizations and projects, while suggesting a new comprehension-conception of the actors and organizational forces in action, the processes, and the standards with which to risk, so that the pertinent projects may be brought to term (Oakley, Borja de Mozota & Clipson, 1990; Cooper & Press, 1994; Borja de Mozota, 2003). It is important to question this approach and to suggest the contribution of several alternative models that, once combined through workshop protocols (Checkland, 1981; Checkland & Scholes, 1999; Wilson, 2001), allow for a new perspective on the project. Just as Boutinet (1990, p. 153, loose translation) suggests, "it is no longer about analyzing a system, but to design it better".

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**Author's Biography**

**Michel de Blois** graduated from the Université de Sherbrooke with degrees in Management and Environmental Design. He started his own practice in furniture and interior design but quickly expanded his expertise in manufacturing to the construction business, where he worked as a manufacturer/contractor of high end specialty architectural metals and as a GC. He specializes in design management, for which he has had a variety of clients: institutional and commercial. After twenty years in the field, he returned to school in order to complete an Msc.A in Design and Complexity at the Université de Montreal. He is now pursuing a Ph.D Aménagement at the same institution. He is affiliated with the Groupe de Recherche IF and also acts as a design management consultant for various projects.