SOME REFLECTIONS ON IS DEVELOPMENT AS OPERATOR OF ORGANISATIONAL CHANGE

A perspective based on Activity Theory and Expansive Learning

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Abstract: We discuss the role of IS development within the context of organisational learning. We present a theorisation about IS development based on the framework provided by Activity Theory and the Expansive Learning model. We propose that the activity of IS development can be understood as an operator of organisational change through a process of expansive learning. We reflect about some of the consequences for IS research and practice. That there can be three explicit perspectives over the context of IS development. That this different perspectives can be combined through the use of explicit models of context and mediators. That IS as organisational change operator could be managed through the co-evolution of models of context and mediators, trough a set of purposeful activities as methodological movements: diagnostic, innovation, creation, evaluation, adaptation and generalisation.

1. INTRODUCTION

Over the years, as a result of both theoretical and practical work, several methodologies have been proposed aiming at structuring IS development to improve the management of the life cycle [DeMarco 1978] [Coad & Yourdon 1990], [Jacobson 1992], [Mumford 1983], [Checkland 1981] e [Checkland & Scholes 1990]. Some more centred on the technical aspects of software production others more aware of the human, social and organisational dimensions of the problem. Although much interdisciplinary work has been done, it seems there is no consensus regarding the usefulness of existing methodologies (and their effective use in practice!) in today's environment of rapid change, not only technological, but also cultural and social [1][10][11]. ??

Nowadays, in spite of all the IS related research (also action-research), the discipline remains problematic, as stated by some authors [Jayaratna 1993] [Checkland & Holwell 1995] [Gould 1998] [Almeida & Roque 2000]. The current organisational conditions and business contexts are based on a set of assumptions different from the early days of IS. This is due, among other factors, to fundamental changes in the management trends and emerging business models, in the value-creating schemes and the enabling “ever new” information technologies [Orlikowski & Baroudi 1991]. As the historical and changing, social, cultural and political aspects become determinants in IS research leading to some new approaches integrating concepts from Social Science and Organisational Studies [Nissen et al 1991] [Bødker 1991] [Orlikowski & Robey 1991] [Ciborra & Jelassi 1994] [Monk & Gilbert 1995] [Galliers & Baets 1998].

IS needs research on models and methods suited for the new context and an efficient way to translate the changes in context to the models of artefacts that we, as IS practitioners, intend to design and build. Our research, in particular, focus on the development of information systems for networked environments, characterised, in essence, by interpersonal relations, with strong demands of interactivity, flexibility and evolution, both of activities and technological solutions on the terrain. These environments arise in Commerce and in some Industrial contexts (including flexible manufacturing, outsourcing and integrating strategies) but increasingly in other contexts such as Education, Health sector and Entertainment. Aiming
at gaining a better understanding of our own practice, we seek to find a theoretical basis, that could 1) guide our work as researchers and IS development professionals and 2) point to some innovative perspectives over practice and research.

Building on key concepts of Activity Theory [Vygotsky 1978] [Nardi 1996] [Kutti 1991] and the model of Expansive Learning, as proposed by Engeström [Engeström 1987], we proceed by analysing the IS development activity as operator of organisational change, in cycles of Expansive Learning.

We then carry on to develop some conceptual tools for the co-construction (or co-evolution) of both context and artefacts, aiming to help IS professionals to become effective operators of intentional changes in Organisations and other Communities of practice.

2. KEY CONCEPTS OF ACTIVITY THEORY

Our analysis is based on the Activity Theory (AT) framework, a philosophical perspective of social constructivism, which builds on the key idea that all human activity is mediated, as originally proposed by Vygotsky and subsequently developed by others [Vygotsky, 1978 e 1986][Leontjev, 1978].

As a cultural-historical theory, focused on the dynamics and changing aspects of human activity over time, and built to be a unifying framework for its study, AT develops the idea of a dialectical process between human and artefacts, shaping and being shaped by both natural and socio-cultural environments, through processes of internalisation and externalisation.

While participants of an activity, aiming at a particular outcome, humans perform actions in relation to a determined goal. Individual actions can best be understood within a larger framework of reference provided by the socially constituted activity. Each activity has its object, understood on the motivational sense, in relation to which we can begin to understand individual actions taken in a community. Broader than a defined goal, this object is almost always conscious and guides human actions in a collective endeavour. Engestrom is one of the researchers that helped the transition of AT out of Russia to the West and that has been further developing it. Set to overcome the old-new dichotomy between the psychological and the social and steamed by the problems of learning, an eminently social activity where individual and group developments are closely convoluted, he proposes of the activity system as the unit of analysis. In his model [Engeström 1987], the structure of an Activity contains three relations between the three main components: Subject, Object and Community. Each relation is mediated by instruments (physical and intellectual artefacts, social rules and organisational patterns of work) that carry with them the history of the relation, past changes and older developments. The classes of mediators proposed are:

a) Artefacts – mediating the relation between Subject and Object (motive) of the Activity. These are any physical instruments or tools, computational or not, but also mental constructs, theories, beliefs and other intellectual frameworks used in interpretation;

![Diagram](image-url)

Figure 1 – The structure of IS development in Organisations by application of Engeström’s framework to ISD activity (adapted from [Ruohonen 1994])
b) **Social Rules** – mediating the relation between the Subject and the Community. *Rules* define roles, values and ethics, and the political-cultural history of the Community;

c) **Division of labour** [or *Organisation of Work*] – mediating the relation between the Community of people collaborating to accomplish some outcome and the Object of the activity that represents their motive.

This concept of Activity can be applied to the study of societal contexts such as organisational contexts, communities of practice and the activity of IS development itself. This model has been further explored, namely in the areas of HCI, CSCW, Organisational Studies and Work Development. Used, essentially, as an alternative inquiry basis to the dominant perspective of Cognitive Science on problems of systems design. A few examples can be found in [Bødker 1990] [Kuutti 1990] [Bannon 1991] [Bannon & Bødker 1991] [Blackler 1995] [Blackler et al. 1999] [Engeström & Escalante 1996] [Nardi 1996] [Kuutti 1996] [Hasan 1998].

In addition to the work being done in those areas, AT has been advocated and used in IS research as a way to approach and consider the problematic of Context, that seeks to combine the social and technological aspects of the human work activity. [Kuutti 1991] [Bødker 1991] [Truex 1991]. The studies based on AT are focused on the understanding and development (past and current) of work practices, considering the information systems as tools, socially built and, as such, subject to a continuous development (in the sense of evolutionary psychology), enabled both by the clients of information and IS specialists [Kuutti 1991]. More recently, some authors have proposed AT as a general framework, bridging several discontinuities such as the study of individual and collective transformation or learning [Kuutti 1991] or the dichotomy between humans and technology [Hasan et al. 1998]. Yet, we would say that the true potential of the AT perspective in IS research remains largely untouched.

### 3. THE STRUCTURE OF THE IS DEVELOPMENT ACTIVITY

Here, we use AT as a theoretical reference to the analysis and understanding of the IS development activity, in a context of Innovation and Technology Transfer (I&TT), slightly adapted from [Ruohonen 1994] and using the model of activity proposed by Engeström.

Nowadays, IS development is such a collaborative activity in itself that we consider the Subject performing the activity as a team of professionals and key participants of the organisation, typically, past, current and future system stakeholders (Greenbaum, 1991)(Grudin, 1991)(Kyng, 1991)(Grudin, 1994)(Sachs, 1995). The IS specialists team, along with the technical component, may possess competencies in other areas such as Sociology, Psychology and Management. This team, with strong relations with the Community and the broader environmental settings for systems development, is subject to several cultural and societal constraints for acting. Sometimes, differences of opinion and even conflicts may arise.
between what the individual elements of the team expect or believe should be developed and what the social-political context determine should be the proper way to act.

Within the AT framework, to understand the Object of our activity as developers is essential to the characterisation of that activity. While IS practitioners, usually, our first challenge is to understand the situation and what is understood by the stakeholders as the problem to be solved, i.e. defining our “space for intervention”. The development of IS, being an activity that relies heavily in the creation of mediators, aims to design and build artefacts for another activity (target) and, direct or indirectly, also for the set of associated activities.

We identify the “Object system” [Hirschheim, Klein & Lyytinen 1995] of a process of IS development as the “Organisation”, understood as a network of activities, interacting inside or outside of what is traditionally considered the frontier of an organisational entity. In our analysis we conceive of the organisation as a network of value-creating activities instead of the more traditional entity-based view of a set of departments, with specific transforming functions, rendering services to each other and the outside. This Organisation is the target context or the result of the intended developmental transformation, and also the context of use of the artefacts to be designed. As such, this network of activities that constitutes the organisation is, ultimately, the IS development Target. This means that the IS development activity is a way to transform the Organisation, by way of creating several instruments (mediators), to a new “activity”, understood as “a cultural more advanced way of doing things”. The Community members can expand beyond their current practice by using and reinventing the use of the instruments of the new activity, as represented in Figure 2. The activity of IS development, while operator of this organisational change, needs to help create an image of the future and build the artefacts for the new organisational activities. To our experience, early in the process it is important to project an idea of what could be the future activities. The central tenet is trying to visualise how the human praxis will change once the artefacts to be developed are made available. Within this framework one can also notice that it is important for the key Community actors to embrace the development process, since it will be necessary to promote the individual and collective learning that will build the Subjects’ relation to the Object of the future activity, through the newly developed instruments. The subjects in the new activities, need to learn the use of the new artefacts because they will create and recreate them, thus determining the effective transformation of the activities in the Organisation. The development team members need to understand the new uses because they need to know what to do next, check the differences between the idea of the expected new context and what effectively arises in practice.

Figure 3 –IS Development as a process of Expansive Learning, adapted from the Cycle of Expansive Transition, proposed by Engeström (1987).
4. THE IS DEVELOPMENT ACTIVITY AS OPERATOR OF ORGANISATIONAL CHANGE

While studying change and learning and the events that take place in activities through time, Engeström expanded on the Finish branch of the Activity Theory community and proposed a developmental work methodology developed around the theoretical principle of the self-transforming activity system (Engeström, 1987). By considering a set of interacting activities with interrelated outcomes (i.e. the outcome of an activity can be the artefact, or the object or the rules, etc. of another activity), Engeström propose that activities change (develop) as an expression of constructive learning through a cycle of expansive transition. Qualitative new forms of activity emerge as solutions to the contradictions (a concept from the dialectic materialism) in the contemporary (old) activity.

In the case of organisational activities, the change may occur as an expression of learning that results from applying any methodology for information systems development (ISD). Combining the concepts and the theory here succinctly exposed with the reflection on our own practice as ISD professionals [Schön 1983], we propose to understand the activity of ISD as a dynamic process of Expansive Learning. ISD will thus be analysed as an activity that seeks to operate a transformation, while part of an Expansive Learning Cycle (ELC), from the actual (old, given) form of the Target Activity to the new (created) form. In the framework proposed by Engeström, it consists of a sequence of steps that begins with a contradiction in the activity system and proceeds towards the resolution of that contradiction, through the successive adaptation of the conditions and elements that originated it.

Succinctly, the starting point of systems development would be to observe and perceive the state of need and primary contradictions within or between any of the elements of the Target Activity. Examples of primary contradictions would be cost of workforce versus mastery of skills by subjects, mismatch between skill available and needed to operate the instruments, hierarchy and specialisation versus teamwork and collaboration, co-located work versus global network of multidisciplinary people, global organisational practices versus local social norms. The Object of the IS development activity can be understood as developing adequate mediators, information processing artefacts and practices, and influencing social norms that could contribute to a solution of the previous contradictions. In order to achieve this, we need first to determine the context of our intervention, which corresponds to identifying the target activities that are perceived as embodying the contradictions to be resolved.

In the second phase, the team must do a complete analysis of the Target Activity and several current methods can be used to find the dilemmas caused between elements of the activity (secondary contradictions), that may occur by the introduction of new corner elements in the triangle of the activity. Examples are qualitative changes in the object of the activity, shared cultural artefacts such as concepts, handbooks, procedures and other forms public knowledge, both conceptual and physical models actually used by the participants of the activity. AT suggests a historical-cultural analysis of the activity in order to elicit the formation of the social and political (even hidden) tensions that need to be considered. Informal interviews or other techniques in which the team is fluent (e.g. ethnography or ethnomethodology) can be used. One of the results of this phase, would be the co-construction of a hypothetical image (or several) of the, consensually understood, new and more advanced form of the activity (and its related element-producing activities), further explored in the next phase.

In a third phase, object construction begins with a search for new artefacts and the reformulation (innovation) of the Target Activity. In order to solve the contradictions found, eventually in co-operation with the subjects of the new activity, the ISD team must strive to formulate general instrumental models that can be translated into new forms of practice, new actions and artefacts modelled for the new activity. Our work suggests that a model of the activity expected after intervention should be developed in this phase and presented both as a springboard for new action patterns and model to experience and test the new activity.

In a fourth phase, the new artefacts must be confronted with the old activity through their practical application or generalisation (e.g. implementation of prototypes for selected tasks or the diffusion of new organisation of work practices). The precursors of the expected new and the old activity interact and disturb each other (tertiary contradiction) creating situations of stress and a new activity is born, eventually, in forms not anticipated in earlier phases. These contradictions may take various forms; e.g., they can reflect the inadequacy between old rules and the new tools or between the old organisational structures and the new forms of collaboration allowed by technology now available. Sometimes, strong emotions such as fear of change, manifest through rebellion, and stress can be
experienced both by individuals and groups. Solutions may be found through close interaction between developers and subjects, operational and managerial, that result in practical solutions to these conflicts. In such emerging practical solutions (reformed artefacts, norms and practices) can reside the initial forms of the new activity.

In the fifth phase, new forms of activity are consolidated through a set of steps where:

a) New artefacts are systematically applied in a repetitive and explicit way;

b) The use of artefacts varies and the new activity gets adjusted, suffering further transformations;

c) The new activity affects neighbouring activities (those that produce its elements or consume its results), resolving or generating new quaternary contradictions. “The new central activity has to compete with and adjust to the dynamics of the neighbouring activities” (Engeström, 1987).

For the IS team its time to observe and do some on-site analysis and not only report but evaluate the correspondence between the idealised image of the new activities (model of the context of intervention) and the adequacy of the mediators developed (model of the solution). Is there a need to adapt the artefacts in order to better support the new created activity or the artefacts are well suited for the new activity? Where new uses found in practice?

As seen, the resulting activity is not a finite state and development of the IS and, generally, of the network of activities that constitutes the organisation, may continue through recurring expansive learning cycles. This perpetual motion and adaptation of the Target Activity is a fundamental property of the Expansive Learning model and has specific consequences for IS development and research. Some of them are presented next as reflections asking for future discussion.

5. REFLECTIONS ON THE IS RESEARCH AND PRACTICE

5.1 One Context, different perspectives to consider

Inspired by our practice and based on the activity model depicted in figure 1, we can identify three dimensions on which to map alternative views of IS development. These dimensions correspond to the three basic relations in the model of activity, that are respectively mediated by Artefacts, Social Rules and Organisation of Work. From our experience, these three dimensions are always present in the context of the intervention especially if we understand it as the target activity, object of ISD transformation. Whether we have chosen to explicitly address them as part of the IS development or not, the three basic relations in the target activity will be there influencing the outcome:

- **Instrumental** dimension: associated with the Subject-Object relation, mediated by intellectual and physical Artefacts that enable the subject to realise the object into the expected outcome of the activity;

- **Social** dimension: associated with the Subject-Community relation, mediated by Social Rules, values, norms or conventions, responsible for defining roles and disciplinary approaches;

- **Organizational** dimension: associated with the Community-Object relation, mediated by forms of Organisation of Work, acceptable practices and co-ordinating instruments.

As stated earlier, IS developers set to build mediators for another activity, aiming at transforming it by promoting the means for a qualitative new form of activity to emerge, need to learn about the Context for the intervention, since it plays a key role in ISD process. As designers we are also asked to envision the context of use of our mediators, if we are to design (and develop) intentionally and to be able to exploit in our proposed solutions the three mediating dimensions in an integrated and intentional way. This means that, depending on the role played by the ISD team, in a particular phase of the expansive transition, the artefacts designed, built and used are always related to or inscribed in a broader context, constituted by the exposed relations and their set of mediators. It may be inadequate, and often is, to develop computational artefacts without contemplating the design of the accompanying social and organisational mediators.

From a social-constructivist perspective, the IS development effort cares not only for the construction of computational artefacts but also with the evaluation of the individual and organisational change mediators. Perhaps we can observe a tendency nowadays, for the participation of ISD professionals and teams to get involved in building new social and organisational rules and other forms of culture. Not only by introducing technological artefacts, but also because IS and related disciplines such as HCI and CSCW, are growing from the trans-disciplinary collaboration with disciplines such as Psychology, and Sociology. This work is a contribution to the understanding and construction
of effective support for interpersonal interactions that define the relation between the subject of the activity and the community that shares its motive. Work on the dimension of Organisation of Work, brought disciplines such as Management, Economy and Organisational Studies to bear on the construction of mediators, such as IS, that impact on the relation between the people and the object of their work.

In contexts of rendering services of Innovation and Technology Transfer, we have been expected to play a role that called for an intentional transformation to the client organisation that extended beyond the development of computational artefacts. Such contexts, in which traditional organisations and enterprises seek research institutions, such as universities, to solve what they understand as competitiveness problems, the expected role is the one to intentionally change the organisation and specifically the socio-organisational mediators, through the introduction of technological mediators. In some cases, that can be arranged, for example, by defining a new business model or a new value-creating network by reorganising work activities. In this case, the context to consider has to include the legacy and other constrains in the information systems and communications, but also the local social rules and codes of conduct, current organisational practices and personal habits, skills available and their development, organisational structures, roles and expectations, internal norms and shared culture. These can influence the emergence of the new form of doing and, even more profoundly, can shape the eventual resistance to change and to the adoption of new divisions of labour and technologies. Yet, we often find it difficult to explicitly address all these dimensions in an integrated and explicit way. Either because our client does not care or is not as sensible to these aspects as it is to, for instance, software delivered on time. We all know these dimensions are there but we are still expected to somehow solve the socio-technical puzzle and present the solution in a computable form. It may still be even more uncommon for an intervention for developing an IS, to be understood as a process aiming at individual and organisational learning on a target environment. Increasingly, the philosophical, political, social and organisational aspects are considered and may even become the primordial object of the ISD effort, but we need to formulate socially acceptable models and methods of delivery of the results of such a form of development.

Clearly all this argues for multidisciplinary ISD teams, since, along with the already recognised value of bringing final users and stakeholders to participate early in the process. There is also a need for people capable of explicitly deal with the different perspectives on context and design the different mediators. These could be professionals from specific areas, such as management, psychology, sociology, anthropology, law, etc. but also IT professionals with a more integrative perspective. Anyway you achieve it, it seems critical to have these core competencies working in the development process, even knowing beforehand that we will never fully prepared and that every developed solution will inevitably be the object of future iterations.

This social-constructivist perspective has also consequences also for the IS research in methodologies (how are we to perform such integrated developments?), but also to the curricula and education of new IS professionals, changing from a model of “knowers” to a model of “learners/builders”.

5.2 Combining the different perspectives

The problem of considering three different perspectives, eventually dissociated, raises the problem of combining them. The importance of making the three explicit is that it may help balancing the focus given to a particular need or requirement demanded by each of the stakeholders, gaining awareness of possible conflicting perspectives and then explicitly trying to negotiate a solution.

Also, the context may be given but it should also be the object of design. This means that there is a need for IS research methods as well as IS development methods to treat Context not only as a given that can be analysed, understood and explained but as something to be explicitly engineered in the three dimensions. We would need to fully embrace the “running specifications” as a natural feature of the learning process in organisations. As researchers, but also as IS practitioners, effective actors of intentional change in organisations and other communities of practice, we need to develop our own mediators to the IS development activity presented in Figure 1. Acknowledging that the problem changes from the need for accurate representations and interpretations of Context to the problem of creating and manipulating the conditions in which certain patterns of activity emerge. And, to the problem of continuously tracking change in order to evaluate and explore opportunities to innovate the context through the mediators. We argue that a particular understanding may be gained by focusing on a model of the mediator (what, how-to) we are
5.3 Context and Mediator Models

As argued before, since our aim is to directly or indirectly design the organisational change, we will be designing new activities or changing their structure. We must have some way of communicating what this structure should be and what new activity systems should emerge. Arguably, we can only know that structure when it takes form with the introduction of the new artefacts, rules and division of labour, interact and interplay with existing elements of the old activity, in cycles of expansive transition. But we still have to be able to characterise beforehand what we expect in order to design mediators for that change to take place.

That change may occur as an expression of learning that results from applying an information systems development methodology or introducing tailor made information systems. Either development can be viewed as aiming at operating a transformation. But until all that happens, we should have some model of our expectations towards that result.

When the design activity is a collaboration of people with different backgrounds and different professional roles, and yet possibly across time and space, we need an externalisation of the model of the target activity that enables sharing of information across the subjects involved in the development. We call this the Model of Context. It is intended to represent the "context of use" of the artefact (or any other mediator, depending on the disciplinary perspective assumed by the designer), for sharing the objectives, roles played, social values, constrains and practices with impact of the design, adoption and use. Additionally, this model could serve for the creation and evaluation of business scenarios and their traceable impact.

To the subset that represents the mediator we call the Model of Mediator. For the IT developer, the Model of Mediator is really a model for the computational artefact. The focus of the design activity becomes the close interplay between both models. As well as between the models and the modelled reality, as they change and co-evolve through time. The ISD activity as operator of organisational change would be managed through the relation between these two models, aimed at the proactive co-evolution of context and mediators, both objects of development practice.

5.4 A set of purposeful activities for IS development

It appears to us that, conventional approaches to the goal of organisational change prove inadequate, partly because they reside on the still popular tailorist metaphor of the “organisation as machine” (Morgan, 1997), implying that the developers team can stand outside the system, observe, diagnose and understand its working parts. It then proceeds by assuming that it can act to redesign the organisation mechanistically, like exchanging parts in a machine to perform more effectively. Albeit considering the possibility of intentionally design the context and the mediators (frequently just computational artefacts) these approaches focus heavily on plans as guarantees for change. Instead, we propose to move the focus of the design activity away from planning change and onto facilitating the emergence of intended results along the parallel path followed by system development and organisational learning. This approach favours an organic view of the organisation as a complex of interactions.

As operators of change, IS research should look for ways of how ISD methodologies might help organisations on crucial moments, making them ready for change or catalysing an intended result. This means that methodologies need to estimate the impact of interventions and the qualitative contribution of systems, techniques and methods to "change to the correct path", i.e., how to know what to do on a situation and warrant that it is the best, on short, medium or long time?

Building on these assumptions and reflections and on a working set of requirements for a methodological framework we have proposed a Context Engineering Approach (Roque & Almeida, 2002). On related work, the relation between the two models is further explored by the performance of a flow of activities, briefly described here.

Diagnostic – a first step to be performed when there is the need to obtain information about the current (organisational) context. "What activities do we perform and how do we do them?" The outcome of this activity is a representation of the context, as this will be the starting point in any development. As representations of context we have tried activity systems and the Value Net framework for strategic analysis (Parolini, 1999).

Innovation – aiming to propose new context activities and networks. Team members may ask questions oriented towards considering new technology adoption but the main focus should always be the new forms of activity. The motive should be to build a model for organisational transformation and the outcome the form of the
expected new context (or activities) that could be useful for creating appropriate artefacts.

Creation – with the objective of producing artefacts for the selected new context or activities. This is traditionally the role of Software Engineering methods within ISD frameworks that corresponds to the specification and production of prototypes and microcosms for experimentation.

Evaluation – activity performed in order to achieve a decision on whether we should re-evaluate our knowledge of the context, refine the mediator for the selected context or proceed towards the generalisation of use. This decision depends upon the nature and relevance of the information the team gathers while performing the evaluation and that, in turn, is likely to be influenced by the specific approach to evaluation (what you are looking for).

Adaptation – activity performed in order to produce a change in the artefact without implying a redefinition of the context modelled. The Adaptation might be accomplished by the team or by the users, since it might be an adaptation of the artefact or an adaptation of the previously intended use, or both in place, in any case probably leading to a re-evaluation of the artefact and associated context.

Generalisation – the deployment of the modelled mediators, from the microcosm where they were developed and on to the target settings so that their use can be consolidated. Notice that by deploying artefacts and other mediators we are also, tacit or explicitly, deploying the new form of context that must interact with the current, established set of activities.

These activities aim at work with both Context and Mediator models as microcosms to understand the impact of the introduction of mediators in communities of practice along the actual development of those mediators, acting as a palette of methodological movements available to IS practitioners. By working with models of both context and mediators to be designed and built, this framework demands rapid and less costly iterations to continually adapt and account for the fast changes in organisational environments. Each IS development process could be a combination of these activities on a sequence unique for each particular situation, that derives from the specific demands of the situation and actual evolution.

Currently, we are working on specific combinations of instruments for context and mediator modelling useful in IS development within the specific context of Innovation and Technology Transfer.

6. CONCLUSION

Based on the theoretical framework provided by the Activity Theory framework and the Expansive Learning model, we have presented a discussion about the ISD activity as operator of organisational change understood as Expansive Learning.

We have presented some reflections on the impact of the proposed perspective. Namely, we made explicit three different perspectives over the context of IS development: instrumental, social and organisational, associated to three different types of mediators of the target Activity. Building on this awareness, we proceed suggesting the notion of proactive development of context and expanding on some implications for the IS research and practice. Namely, the need for an explicit sharable representation of context (Model of Context) and mediators to be developed (Model of Mediator). We argued that ISD as organisational change operator should proceed through the co-evolution of these two models, and worked out by a set of purposeful activities as methodological movements: diagnostic, innovation, creation, evaluation, adaptation and generalisation.

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