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ERP GLOBAL TEMPLATE AND ORGANIZATIONAL INFORMAL STRUCTURES

A PRACTICE-BASED STUDY

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Abstract

Based on an interpretive case study and Activity Theory as a theoretical framework, this contribution shows how local users of an enterprise resource planning system in a Chinese joint-venture of a French multinational corporation have developed an informal organizational structure which eventually led to workaround work practices. The development and quest for alternative practices was justified as indispensable and appropriate to respond to local needs. In that perspective, the formal structure was not sufficient to cover the problems met at the Chinese subsidiary. Our research tackles an original aspect of post ERP implementation since it suggests that informal work practices might eventually lead to the adoption of global IS.

Keywords: ERP global template, Activity theory, Organizational informal structure, Workarounds, ERP usage

1   Introduction

Multinational corporations (MNCs) are oriented toward a clear definition of their goals and supported by formal structures that are geographically dispersed. Any structure of an MNC is explicitly connected to the achievement of the MNC's goals. In order to support this quest for effectiveness, the use of Information Technologies (IT) is considered as a "must have". In terms of IT available to support the MNCs activities, Enterprise Resource Planning (ERP) software is the most commonly used solution as it can fully integrate the whole set of functions within one worldwide IS. The belief behind the extensive use of worldwide ERP systems is to set up and manage a "boundary object", available through all the different sites of the MNC (Bannon & Bodker 1997; Pawlowski et al. 2000). This "boundary object" is expected to provide a single communication and control tool to interact within and between communities of users but also to reduce the "distance" between the head office and the remote subsidiaries. Whatever the local specificities of each remote site, all the users are expected to use the same set of data, reports, and business processes through a unique worldwide IS.

However this rational stance has problems particularly when considering changes that might take place outside organizations, and additionally it does not consider internal dynamics. Employees in organizations may attempt to achieve formal goals through the establishment of formal coordination and role allocation. At the same time, our research suggests that spontaneous processes emerge in order to fulfill formal aims. That means that these two structures, formal and informal, need not be in conflict with each other. On the contrary they may very well be complementary. Thomson (1967) argued that the technical level in an organization is dominated by formal goals and structures whereas personnel management and external relations could best be described in terms of informal processes. Open systems theories have and advantage over rational theories. Activity theory (Engeström 1999) for example, can explain organizational adaptation to external and internal conditions, because it focuses on what actually takes place and not how well everything is adapted to formal goals.

Our research brings the evidence that informal processes might be a complement to formal structures even at a technical level. Informal structures for cooperation, support and learning emerge in order to correct shortcomings of formal structures. Groups and teams communicate and support each other informally in order to achieve formal goals more often than for the fulfillment of informal goals (Leplat 1991). Informal structures aim at fulfilling the demands of formal work tasks by establishing communication channels in order to facilitate transmission of knowledge from a person who has it to another person who lacks it.

This paper focuses on the study of local ERP work practices following a template rollout in a Chinese subsidiary of a French MNC. We analyze the emergence of informal workarounds developed by Chinese users based on a practice-based study. The contribution is organized as follows. In the next section we discuss our research context. In a third part we demonstrate the relevance of adopting

Activity Theory as a theoretical framework for our study. In the fourth and fifth section we discuss the methodology adopted and data analysis. Lastly we discuss our findings.

2   Research Context

2.1   A worldwide ERP rollout program from a French MNC

The company studied (herein called 'the company') is a leading international player in the energy business with headquarters in France. It is established in more than 40 countries with 70,000 employees worldwide. Its business includes all business activities in the nuclear power field but this case study is centered on only one of these activities concerned with the building of infrastructure for the transmission and distribution of electricity.

In 2000 the company agreed on a set of Joint-Ventures (JVs) (51% French: 49% Chinese ownership) with the biggest electricity distribution company in China for the building of new infrastructure. The energy market in China is huge with exponential growth in demand. Setting up such JVs was the only inroad into the Chinese market at the time. By 2004 it had established five sales offices, one wholly-owned factory, and four joint ventures employing 820 employees in China.

The aim of the company worldwide ERP programme is to implement modules of SAP R/3 4.6 in all the different subsidiaries of the MNC. In 2006, the first Chinese project took place in two pilot subsidiaries located in the suburbs of Shanghai. The particular template designed by French headquarters focused on five modules. These are finance (FI), control (CO), sales and distribution (SD), materials management (MM), production planning (PP) and project structure (PS). Regarding the technology infrastructure, SAP servers are located in France and these are connected using a private network connection to the workstations in their French and foreign sites. In general, the company studied employed two teams in each ERP implementation rollout.

The usual company procedure for this kind of ERP rollout is to send the HQ ERP consultants from headquarters (called the HQ team) on the subsidiary site for a two-week period in order to communicate the basics of the global template to the local project team. Then, they controlled each project from France through daily conference calls. It seems that for this company the average duration for such an ERP rollout is about 12 months. It implies four consecutive phases: program setup, business blueprint, realization and maintenance, and support.

2.2   Focus on work practices and the role of embedded agents

Our research perspective aims at adopting a human agency stance as we believe that human actors do not merely repeat past routines, but they are the inventors of new possibilities for thought and action.

This phenomenon of unintended practice or reinvention is often studied by organization researchers through the concept of "performativity". This emphasizes the fact that activity is accomplished by skilled actors who rely on practical–evaluative agency (Emirbayer & Mische 1998) to understand and assess how practices can be altered or tailored in order to accomplish specific tasks that were not initially planned or supported. Thus, performativity encompasses any deviations which modify practices to address localized contingencies (Orlikowski 2000). In the following we discuss how activity theory proposes an original but nevertheless relevant perspective to look at these original work practices dynamics.

3   Activity Theory as a theoretical framework

Activity theory emphasizes cultural and historical ideas and the active and constructive role of humans. It is based on the writings from Soviet cultural-historical psychology, founded by Vygotski, and Leontjev during the 1970s (Engeström 1999). As a broad definition we could state that activity theory is a cross-disciplinary framework for analyzing different forms of human practices as development processes, at both individual and societal levels.

We see this theory as a powerful perspective to focus on human work practices as it incorporates notions of intentionality, history, and collective activity. As opposed to the study of the individual as a separate entity, in Activity Theory the unit of analysis is the entire activity. An activity is composed of a subject and an object, mediated by a tool. A subject is a person or a group engaged in an activity embedded in a particular context. An object (in the sense of 'objective') is held by the subject and motivates the activity, giving it a specific direction. The interaction between the human agent and its object is mediated by cultural means. An object can be a material thing, less tangible (a plan) or totally intangible (a common idea), as long as it can be shared for manipulation and transformation by the activity participants. This original structure is too simple to illustrate the systemic relations between an individual and his environment in an activity, however, and thus a third main component, namely the community of actors (those who share the same object) needs to be added. This extended model has been conceptualized by Engeström (Engeström 1999).

In the context of our research, the subject are the Chinese users of the newly implemenented ERP system. They are working collectively (named the "community") around a common objective (the object) which is the adaptation of the global ERP system to overcome its misfits when applied to the Chinese environment. It results (the outcome) in the development of unintended and alternative ERP practices. The mediation can occur through the use of many different types of tools, material as well as mental tools. From our research we identified the emergence of an informal organizational structure which produced workaround strategies based upon process adjustments, data adjustments and third systems. The "rules" cover both explicit and implicit norms, conventions and social relations within the community of users; and the "division of labour" refers to the explicit and implicit organization of the community engaged in this transformation process.
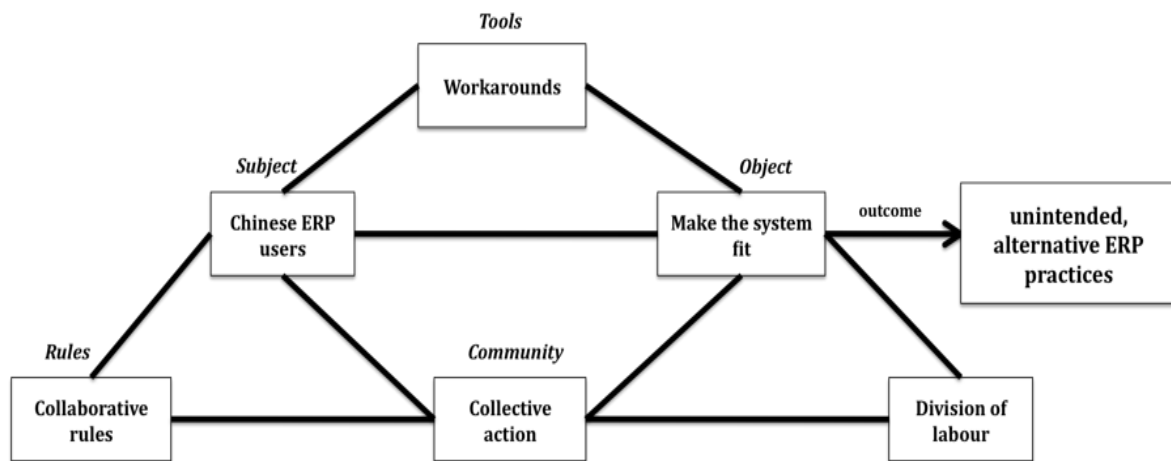
Figure 1.Interpretation from Activity Theory extended model

4   An interpretive case study

This research follows an interpretive case study approach (Walsham 1995). This case study seeks to observe and collect data on work practices regarding the use of a global ERP system within a Chinese joint-venture (JV) of a French MNC. One of the authors gained this access to the field because he previously occupied a position of "SAP internal consultant" for the Chinese JV under study. Thus, by being on site, he has access to the local users, including project managers, key users, and end users. Interviewing is the major technique used for data collection. Initially, the project leader allowed him to request as many interviews as desired, from any JV member affected by the ERP system. However, over time, this full access has been reduced as some functional managers disapproved of their participation in this "critical" study. Indeed, as more and more users claimed the spread of workaround strategies, the project leader became less comfortable with this interviewing process. However, the research process is not affected by this restriction as informal interviews with users continued to take place. As another source of data, documents such as formal and informal training manuals, email exchanges, meeting minutes, and presentation slides were also consulted. A total of 16 interviews with 11 different organizational members have been conducted. Details regarding interviews are found in table 1. All the interviews have been tape-recorded and transcribed.

Position of the person interviewed	ERP status	No. of interviews	Total duration of the interviews
Production manager	Manager	1	40min
Sales manager	Manager	1	1h00
Finance manager	Manager/Project leader	2	3h10 min
Accountant	Key-user	2	2h40 min
Finance controller	Key user	1	50 min
Accountant	Key-user	2	3h45 min
Product line manager	Key-user	2	2h30 min
Sales manager	Key-user	1	1h45 min
Project manager	Key-user	1	1h30 min
Accountant	End-user	1	1h25 min
Accountant	End-user	2	3h00 min
Total	3 managers 6 key-users 2 end-users	16	22h15 min

Table 1.Interview details

5 Data analysis

First, we briefly discuss the rollout implementation process as an introduction to our analysis. Then we discuss the initial situation of chaos, and the emergence of an informal organizational structure which led to self-learning processes and eventually the enactment of some workaround practices.

5.1 Rollout implementation

The ERP system was the first global software implemented at a Chinese JV of the company. The local IT team had only hands-on experience with the development of ad-hoc systems. Thus, following the recommendations from the IT headquarters team, they decided that it would be safer to adopt the company's processes embedded in the global ERP package rather than to modify it to fit the JV's existing processes. The HQ teams stressed the fact that each modification would require extra work and would also complicate future upgrades. This inflexibility of the system was immediately regarded as a source of constraint by local staff:

> *When we asked [during the initiation phase] how to handle this type of process or this type of local specificity, the HQ functional team did not know how to answer most of our questions.* [Key user in Finance]

To prepare the future users, training sessions were made available for each department and each scenario or process. Most of them lasted about 2 to 3 hours depending on the topic. Interestingly, tutorial memos were only given to the attendees as the project leaders wanted to promote a voluntary approach. It did not deliver the expected behaviour as the user's lack of participation in this training proved really detrimental. However, the HQ and local project teams did not adjust the implementation

schedule to ensure an higher adhesion (and involvement) of the local actors within the first stages as suggested by the following:

> *I agreed with the management team to push toward a voluntary adoption of the system. But it seems that our intention was not clear enough. Recently, I had some talks with my employees and it seems that they had the feeling that we did not care about the training and feedback on the system. According to them, our only concern was to roll it out as soon as possible and to declare it as a success to the Parisian headquarters. [Finance manager]*

Interestingly (and surprisingly), the Chinese subsidiary won the prize of best ERP implementation at the MNC in 2006. This prize is based on the HQ team feedback and evaluations. It is difficult to get a complete picture of the criteria used for evaluation but it certainly took into account the project duration (11 months) and the level of customization applied to the global template during the rollout project (almost none except for the Sales & Distribution module). In sum, the MNC headquarter leaders considered the first rollout implementation into a Chinese JV to be very successful. The ERP system had a smooth go-live period since all the data had been cleansed by the local IT team. However the local project leaders and JV functional managers were concerned by the extremely low attendance rate to the training sessions and then its impact on the usage of the newly implemented IS.

5.2   Chaotic start

As users attempted to use the ERP system, most of them rapidly became overwhelmed by the complexity of it. Users from the Finance department were especially disappointed by the data entry process which was complex and somehow too elusive. Additionally, some mandatory information related to the local regulations was missing.

> *For very simple operations such as data entry of a new customer, it takes me at least twice the time of what was needed with the legacy system. All the processes are much longer because they are much more detailed. But for me, most of these fields are useless […] the worst thing is that some critical fields regarding the Chinese tax calculation are missing which means that we have to double entry data in both systems. [Finance user]*

This issue related to the calculation of the local tax was indeed handled by the use of a legacy system in parallel. It meant data entries in both systems. Addition to the complexity of the ERP system, this double data entry procedure was an important barrier to the acceptance of the system.

> *This lack of detail regarding the Chinese taxation system led us to maintain the legacy system as it is a formal obligation for any international JV here in China […] We attempted to explain to the Chinese tax bureau our situation but they did not allow any delay whatever the circumstances […] On the one hand, I had to fiercely promote the use of the ERP system to my users and on the other hand I was asking them extra work to enter data in both systems to get our official tax reports ready on time. In terms of human resources management, it was a real mess. [Finance manager]*

In other departments, it was also chaotic. Users did not feel at ease with the system, even with the assistance of the ERP functional consultants (hired from an external IT/IS company) for 2 weeks after go-live. The main complaint was about the processes lack of fit plus the double entry related issues.

> *We were pushed by our managers to use the new system but even with the help of SAP local consultants, we did not find out how to handle some exceptions or to get some intermediary reports without using external spreadsheets. Then after go-live, we were still using both systems in parallel. All the missing information in the ERP system was managed through our legacy system and then loaded manually via spreadsheet files. It was extremely time-consuming but we had no other choice to satisfy both daily business and MNC obligations. [Production user]*

> *Usually, the users tended to forget to enter data into one system or the other. I remember a few times when we were urged to figure out the missing data for our monthly closing. All the reports were wrong and the top management was blaming my team. We ended by using our legacy system [Production manager]*

Following the rollout of the new system, users progressively made their own learning of the system. As the functional support ensured by the headquarters ERP team was judged unsatisfactory, key users of each department took the lead to propose additional training sessions based on their own understanding of the system. These informal training sessions took place during lunchtime or after working hours. End users eventually felt involved as the key users knew exactly their expectations and then could anticipate their questions. It seems that rapidly a friendly atmosphere developed around this learning approach.

> *As Finance manager, I had no clear visibility on the content of these meetings but I found it positive as the users seemed much more willing to learn and train their colleagues. It was a great relief for me [...] Some regular users became much more attracted to their job as they could train their own boss. [Finance manager]*

The creation of this collective activity took place without the decision or formal support of any manager. Most of the users met weekly to discuss problems and share tips. The finance and production key users created together, first a mailing list, and then a Lotus Notes database to keep users aware of the coming meetings and share the problems and tips discussed through previous sessions. These communication channels helped the users to rely on each other for assistance. The basic objective was to share any useful functionality.

> *Once we started to share our tips, I was amazed by how much we learned everyday. Everyone was trying to bring his contribution to the group to thank the others about their previous help. [Finance user]*

> *Because I had already use SAP/PP in a previous company for almost 3 years, I had a good knowledge and visibility of the functionalities and reports available in the system, and how to get access to them. Then I rapidly became a trainer for my colleagues. I also taught them how to use some empty fields to avoid extra work with the legacy system. People from Sales and Finance also attended some of my training sessions as they were interested to get tips to see if they could apply them to their processes. [Production key user]*

Given the system's inflexibility (Robey et al. 2002), users deviated from the prescribed processes embedded in the global template to make it fit their needs. One instance of alternative practice comes from the Sales and Distribution people who entirely reconfigured the bidding process by using the empty fields available through each screen input. And then, the use of empty fields to capture information which were not initially planned with the global template became a common practice for the different departments.

> *The system is so complex and in a way so powerful that once we understood how it works we found our own way of using it. I would say that for each screen there are at least 3 empty fields [that were not configured by the global team]. Then, we started to use those fields. For example once a purchase order is entered in the system you cannot modify the payment terms afterwards which is awkward since the buyers do not always have this information or even worse it could evolve over time depending on the relationship with each supplier. Then we used a field [initially empty] to put this information in the system. [Finance key user]*

Following the development of those parallel processes, the users also agreed on parallel data codification and formats. For example the management of sub-vendors were added by the local users at it was not initially handled by the template. They added 2 digits to the initial vendor code identifier (initially composed of 6 digits) to keep track of the connection between vendors and sub-vendors. Another example is found with respect to the financial statements. The original codification for miscellaneous expenses payable did not provide sufficient visibility for local managers as they were used to draw some distinction between different types of miscellaneous expenses. Consequently they also designed some new codification to decompose the nature of such large accounts.

6   Discussion

6.1   ERP use and informal learning

Our field investigation demonstrates that to use an ERP system satisfactorily certain knowledge and skills are necessary. Here the local users were clearly lacking knowledge for various reasons. Because most of the users did not attend to the training sessions given by the MNC consultants. Another reason was that they did not find the right knowledge when they asked for help to handle their local specificities (e.g different taxation system). Furthermore, in our research we observed a need for new knowledge in order to be able to give satisfactory solutions to original problems. Clearly, the MNC consultants did not succeed to transmit the right knowledge for each purpose. The given instructions seemed far away from the concrete issues. As a consequence the system was not accepted or well used in the first round. One way for the local users to find the knowledge needed in certain situations has been to spontaneously organize informal training sessions with more experienced key users. The great advantage with informal support was that the knowledge transmitted was immediately accepted and applied. When users asked their colleagues to help them they were asked what was important to them and what they were eager to find a solution to. Any answer they got was considered and tested immediately.

A major finding from this field investigation is that the formal structures are not sufficient to cover all problems. The local users at the Chinese subsidiary reorganized themselves informally in ways that differ from the original formal organization plan. Some end-users rapidly became "key" users and trainers as they shared theirs past experience on similar ERP systems. They also designed informal training and new communication channels. This informal organization can be seen as a result of the inadequacy of the global system to meet the local demands. It means that the grounds for the existence of this informal organization should be sought in factors related to the inadequacy of the headquarters system to meet the local specificities at the Chinese subsidiary.

6.2   Local workarounds

As a consequence of this informal organizational structure we identified the emergence of alternative ERP work practices to the ones prescribed by the global procedures and formats designed within the ERP template. Based on the work of Gasser (1986) we call those practices "workarounds". In our case study, working around means intentionally usingcomputing in ways for which it was not designed, or avoiding its use and relying on an alternative means of accomplishing work. Workarounds are typically ad hoc strategies to solve immediate and pressing problems. They often conflict with the formal ideology of IS usage. Through our investigation, we have discovered three forms of workarounds: data adjustment, procedural adjustment, and backup systems.

Data adjustment. In several situations, we have found users "cheating" the ERP system by entering data that they knew were "inaccurate" or that did not reflect the data codification expected by the system. They did this in order to get "usable" results. For example, the local accountants have designed their own data codification (adding five miscellaneous sub-categories) to track the expenses of the sales team. Similarly, for the payment terms conditions, they changed the initial codification prescribed through the global template in order avoid the blockage of the manufacturing process.

Procedural Adjustment. Another way of working around formal computerized routines is to modify organizational procedures. The ability to work around established procedures depends upon having the power, access and skills to create and exploit the capabilities of the ERP system. Some procedures such as the monthly closing are absolutely inflexible but for some others, such as the bidding process, the local users found ways to overcome the misfit by using empty fields for each screen and then design a parallel procedure which fitted their requirements.

Backup Systems. A third type of workaround is the use of alternative or backup systems, manual or automated. Some backup systems are manual, involving duplicate records, local databases, spreadsheets, handwritten notes. It could also be seen through the parallel use of legacy systems. We observed that for some procedures local users were obliged to make double-entry within the ERP system and the legacy system in order to be able to fulfill the taxation system requirements.

Those unexpected processes were not formal driven projects, but informal and unexpected processes developed at the level of local users without the support from any HQ managers. As discussed above, the rollout of the first ERP system into a Chinese JV for the company investigated started with a chaotic situation. Local users were disappointed and lost about the complexity and generic aspect of the ERP system as it did not cover most of the local functionalities expected. Then the local users progressively learnt the system's scope and features by organizing informal meetings and training to share and exchange their findings and/or difficulties. They also set up an informal communication channel (mailing list) and a database for knowledge sharing. This collective action based on the sharing of tips and workarounds incrementally led to the development of alternative and unintended practices. The users have indeed collectively succeeded in setting up a workable system that satisfies the local needs and the MNC expectations even though it was realized through unexpected and unofficial ways.

7　　Conclusion

The use of Activity Theory allows us to propose a micro-level study focused on the emergence of alternative work practices as the result of the misfit between the newly established IS and the local demands met at the Chinese subsidiary. Our focus on the activities and intentions of Chinese users seems a powerful perspective to analyze the emergence of an informal organizational structure and workaround practices.

Consequently, an interesting finding emerged from our research: a global ERP system can provide a platform for original activities. The local users have indeed proven to be knowledgeable agents with a capacity to reflect and act in other ways than the ones prescribed by the headquarters through the ERP template. They have proven their capacity to imagine informal and alternative possibilities within the contingencies of their environment. The cooperation of different individuals and/or groups was the tenet of a collective workaround strategy directed towards a same objective: make the system fit with the local requirements. The development and quest for alternative practices was justified as indispensable and appropriate to respond to local needs. In that perspective, the formal structure was not sufficient to cover the problems met at the Chinese subsidiary. Consequently, the local users reorganized themselves informally in forms that differ from the original formal organization plan. We have also understood that given the high interdependence of factors influencing the adoption/diffusion of an ERP system and the unique settings of each remote subsidiary, it is very difficult to anticipate future problems and to identify the corresponding knowledge necessary to solve them. Therefore it is difficult to supply adaptive and functional knowledge. Every knowledge transmission and cognitive support method, such as formal education, introductory courses, manuals, on-line help and so on, which are constructed in advance and before the problem they target has emerged, may not be sufficient. Furthermore, such methods can only include knowledge for handling already known problems, or when there is a clear and concrete picture of a future cognitive disequilibrium. This was clearly unsatisfactory in the context of the Chinese subsidiary investigated.

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