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BETWEEN INDIVIDUALISATION AND COLLECTIVISATION: ILLUSTRATION OF CHANGES IN WORKING AND EMPLOYMENT CONDITIONS IN THE NORTH AMERICAN CONTEXT

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Abstract

The importance of knowledge as a source of growth in the current economy and of innovation in the context of intense global competition is prompting organisations to review their objectives and promote greater flexibility. Thus, with the ever-increasing use of knowledge workers, forms of work organisation and the modes of employment regulation relating to them are being reviewed in order to increase this flexibility. As a result, the traditional work and employment model relating to knowledge workers has been replaced by new models. The present study examines the way forms of work organisation are combined with modes of employment regulation in the new economy, in particular, with regard to knowledge workers. It is based on a qualitative methodology involving the comparative study of two cases, namely, a company in the high-technology sector and a company in the energy sector. The analysis of the organisational and institutional dimensions of the companies under study brought out a series of work and employment models relating to knowledge workers. These models are based on an individualisation or collectivisation of each of the dimensions examined. The observed models fluctuate between flexibility and stability, thus between new approaches and traditional approaches.

Keywords: work organisation; employment regulation; working and employment conditions

Topic groups: human resource management

JEL Classification: M51, M50, O15

1 INTRODUCTION

The transition from an economic development model centred on industrial mass production to a model in which the economy, work and firms are conceived in a different way has been widely observed both in writings aimed at the general public and in the academic literature. This emerging economy, a technical-productive paradigm initiating a new cycle of growth driven by information and communication technology, is based, among other things, on knowledge (Gordon, 2001; Freeman and Soete, 1994) and the capacity to manage information and innovate, rather than on the quantity of working time or material capital (Sapsed et al., 2002). Highly skilled workers thus become particularly important in this changing model of economic development. As pillars of firms in the new economy, these workers are more specifically characterised as *knowledge workers* (Drucker, 1959; Osberg et al., 1989; OCDE, 1995; Lavoie et al., 2003). They design and develop new products and identify and solve problems, in particular in the field of science and technology.

In this context, the new economy calls into question the main dimensions of the work and employment of these knowledge workers (Beaudry, 2008). Thus, knowledge work is being profoundly renewed and different models relating to knowledge workers are emerging. These models are characterised by forms of work organization and modes of defining and regulating employment conditions that are different from traditional ones. The present study focuses specifically on the different models relating to knowledge workers under changing forms of work organisation. It also examines the modes of employment regulation relating to these workers in the new economy. These forms and modes will first be described and then used to construct a typology of work and employment models among knowledge workers. This article is based on qualitative research involving a comparative case study conducted in two companies: one operating in the energy sector and the other a multinational company operating in the information and communication technology manufacturing sector.

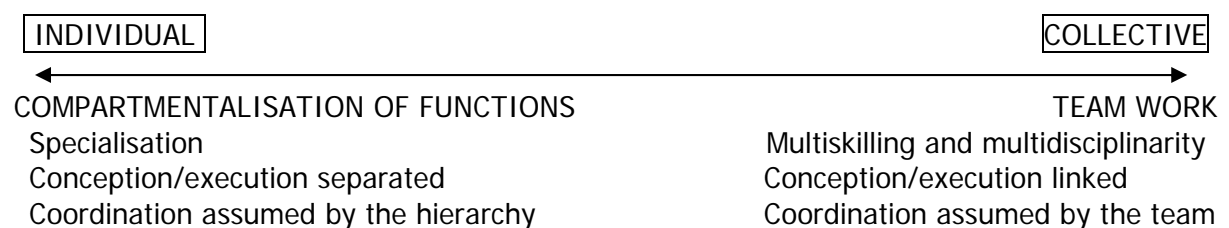
2 THEORETICAL FRAMEWORK

Based on French regulation theory, some organisational sociologists (Bélanger et al., 2002) have put forward a framework for distinguishing organisational aspects from institutional aspects in the macro spaces (the production system) and micro spaces (the firm) in which changes in the world of work take place. Based on an understanding of the production system as relying on coherence between the mode of regulation, regime of accumulation and model of work organisation (Bélanger et al., 2002), organisational sociology breaks down the organisation into the institutional and organisational dimensions which define its specific structural configurations. In the regulationist literature (Boyer, 2002), the organisational sociology literature (Bélanger et al., 2002), and studies stemming from organisation theories (Roy and Audet, 2003; Mintzberg, 1979), the organisational dimension is defined as including the forms of division and the principles of coordination of work. The organisational dimension refers to both the technical organisation of work, or degree of task specialisation (Bélanger, 2000), and the social organisation of work, that is, the links between conception and execution functions (De Terssac, 1992) and the type of supervision favoured (Bélanger et al., 2002; Bélanger, 2000). As for the institutional dimension, its definition also draws on regulation theory and organisational sociology, in addition to institutional approaches (Benner, 2002; Lam, 2000), and denotes the contractual relations between workers and the employer. The institutional dimension thus refers to both how employment conditions are determined and the employment conditions themselves, such as those relating to social protection, employment status, remuneration and training (Beaudry, 2008).

We constructed a typology of work and employment models based on these two dimensions, each being placed along a continuum forming an axis. The poles of each of these axes correspond to whether the work organisation (organisational dimension) and employment regulation (institutional dimension) can be characterised as individual or collective. This process of identifying the poles of axes is based precisely on the literature on the new economy and on knowledge workers, which reveals that the approaches to work organisation appear to be evolving from an individual model to a collective model whereas the approaches to employment regulation, on the contrary, appear to be evolving from common and shared modes to individualised modes (Hesketh, 2003; Benner, 2002; DeFillippi, 2002; Capelli, 1999; Carnoy et al., 1997). Thus, the organisational dimension, as illustrated in Figure 1, is characterised as individual when occupations and tasks are compartmentalised. In this context, “the generalisation of the labour process [...] extends the logic of work organisation inherited from Taylorism” (Boyer and Juillard, 2002: 378; trans.). According to this logic, a worker cannot both plan and conceive the work and execute the work that has been planned and conceived (Taylor, 1911). Consequently, the functions of knowledge workers only involve conception since execution is reserved for other categories of workers (Meiksins, 1982). This division between conception and execution particularly encourages the specialisation of knowledge workers (Derber, 1982; Meiksins, 1982). In this context, the autonomy of knowledge workers becomes relatively limited since the fragmented conception tasks are prescribed by management and their execution is also stipulated through set procedures, standards and rules (Meiksins, 1982).

On the other hand, work is characterised as collective when it is performed within a team. Workers are required to perform a great number of tasks and participate collectively in innovation (Lindkvist, 2004; De Fillippi, 2002; Keller, 2001; Hobday, 2000). In this context, knowledge is mobilised and interactions and communication within the group facilitate knowledge exchange (Amherdt et al., 2000). This knowledge is then shared among the knowledge workers themselves and with other categories of workers, thus fostering innovation and problem solving (Le Boterf, 2001; Winslow and Bramer, 1994). The distinction between conception and execution thus diminishes. Moreover, when work organisation is collective, the knowledge workers organise their work themselves and thus enjoy a degree of autonomy within the teams (Cordery, 2005; Lindkvist, 2005; Sydow et al., 2004).

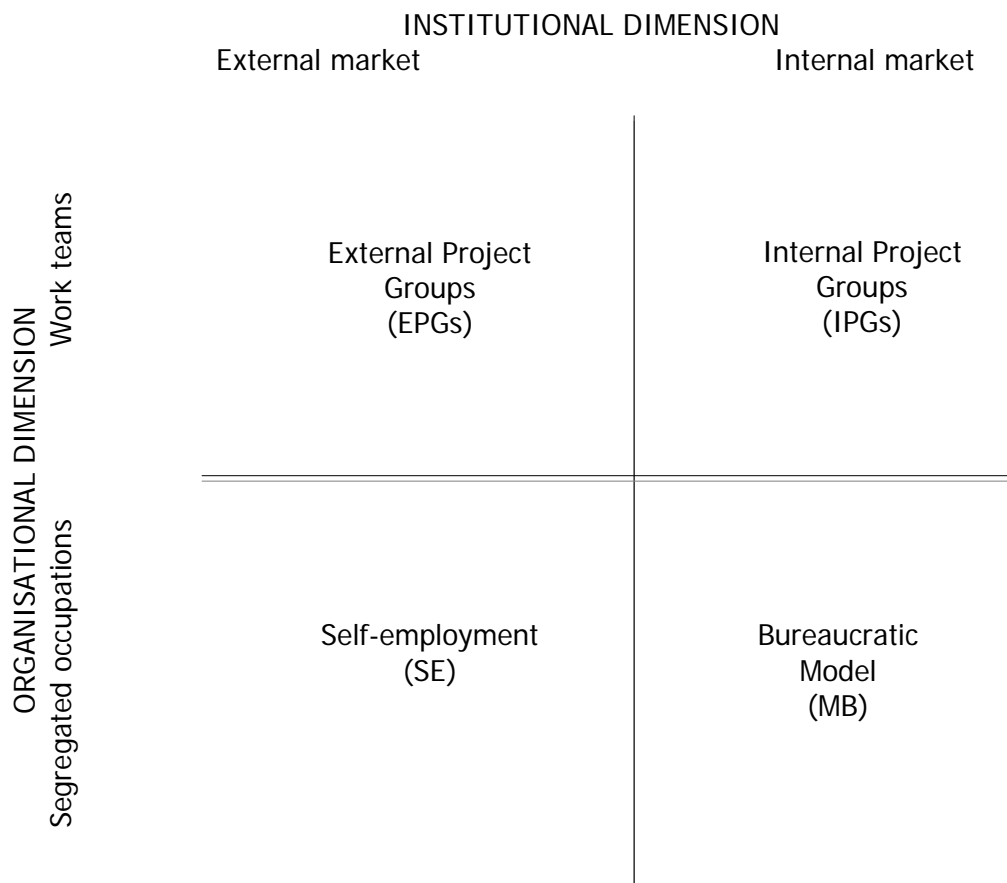
Figure 1: The organisational dimension



With regard to the institutional dimension, as illustrated in Figure 2, employment regulation can also be characterised as either collective or individual. It is collective when it takes place mainly within the internal labour market (Lam, 2000) whose rules protect workers from competition in the external market. In this case, employment conditions can be determined according to two possible options: they can either result from collective bargaining within the establishment or be set unilaterally by the employer and apply to all workers. Standard forms of employment are favoured, that is, those involving a subordinate employment relationship of indefinite duration, for a single employer within a single firm. As regards the modes of

trans.). Moreover, although management grants a degree of autonomy to knowledge workers, the division of work at both the technical and social levels hampers personal initiative (Mills, 1966). This form of control generally aims to ensure tight planning and coordination of the production process (Bélanger et al., 2002). This type of work organisation is combined with collective employment regulation. Working conditions are most often negotiated collectively and job-related risks are assumed by the employer (Goldenberg, 1968). When no collective representation exists, internal market rules prevail and conditions are the same for all workers in the same category. Standard forms of employment are implemented, characterised by an employment relationship of indefinite duration for the same employer and within the employer's firm (Bernier et al., 2003), thus facilitating the programming and coordination of the production process while ensuring a stable and regular workforce. Lastly, remuneration is stable and fixed on the basis of seniority.

Figure 3: Typology of knowledge workers: work and employment models



However, this traditional model of work and employment is weakening and being replaced by new trends: the intensification of collective models of work (Lindkvist, 2005; Sydow et al., 2004; Le Bortef, 2001; Amherdt et al., 2000; Wittorski 1997) on the one hand, and the individualisation of the employment relationship (Benner, 2002; Bacon and Storey, 1993) on the other hand. These two trends are developing separately or are combining to form different work and employment models.

Thus, the *self-employment* (SE) model combines individual work and individual employment. As in the traditional model, occupations remain segregated, with each worker performing

specific conception tasks, based on their own expertise which they are not required to share. On the other hand, and contrary to the bureaucratic model, employment regulation takes place in the external labour market. Thus, workers negotiate their employment conditions individually, based on their personal contribution to the firm (Oiry and Iribarne, 2001). Employment conditions are also determined by the situation in the external markets, according to the economic situation prevailing at the time the contract is signed (Vendramin and Guffens, 2005). Employment conditions thus vary from one individual to the next and job-related risks are sometimes assumed by the workers themselves. In fact, knowledge workers respond to the specific needs of firms, which may involve significant inter-organisational mobility (Wallace, 2004; DeFillippi, 2002), making collective representation more difficult. They are required to develop their employability and seek training on the basis of labour market needs (Boltanski and Chiapello, 1999). Furthermore, their remuneration is generally variable and depends on their ability to rapidly and accurately solve the problem or problems presented to them (Shih, 2004; Reich, 2001).

In contrast with this model, *internal project groups* (IPGs) combine collective work with collective employment relations. As in the bureaucratic model, employment regulation takes place within the internal labour market. However, work is performed within multidisciplinary teams, which has the effect of desegregating the occupations. Each worker contributes to the team's success, using his/her knowledge and sharing it with other team members and other types of workers (Lindkvist, 2004; DeFillippi, 2002; Keller, 2001; Hobday, 2000). In this context, knowledge workers enjoy a great deal of autonomy and coordinate their work themselves (Cordery, 2005; Legault, 2004; Benner, 2002). Since employment regulation takes place within internal markets, employees participate collectively, through their union, in determining their employment conditions within the firm. When employees are not unionised, the conditions are set unilaterally by the employer and apply to all knowledge workers in the same job category. Standard forms of work are used and contracts are open ended. Teams are thus composed of workers employed by the firm, which can facilitate collective representation.

The last model, involving *external project groups* (EPGs), combines the two new trends: collective work organisation and individual employment regulation. It is thus at opposite poles from the traditional bureaucratic model. Like internal project groups, external project groups organise their work themselves in autonomous multidisciplinary teams. Occupational desegregation is promoted. Moreover, knowledge workers participate in creating new products or solving problems with other workers. In this case, however, the teams are composed of external experts brought together for the duration of a specific project. Team members can, on the one hand, be hired for a single project or series of specific projects or, on the other hand, be employed by a subcontracting firm involved in the project (Benner, 2002; Carnoy et al., 1997). Once the project is completed, the team is dissolved (Sydow et al., 2004; Gann et al., 2000). In these cases, employment regulation takes place within occupational markets rather than internal markets. Individual negotiation of working conditions is favoured and the workers assume some job-related risks. As regards workers in the subcontracting firm, their conditions are set by this firm rather than by the user company. Thus, for the same project, the employment conditions of knowledge workers can vary from one employer to another, over time and for each worker. In both cases, employment conditions depend not only on individual negotiation but also on the prevailing economic situation.

These four models contribute to characterising work organisation and employment regulation. However, they represent ideal-types. Thus, the preliminary interpretive proposition proposed is that there are several ways in which the main components of the firm in the new economy can be configured, thus giving rise to the existence of different models. More specifically, two secondary propositions are examined. First, companies in traditional economic sectors implement work and employment models that are characterised by a combination of new approaches and traditional approaches inherited from the bureaucratic model. Second, companies in the new sectors which are typical of the new economy (biotechnology, multimedia, telecommunications, and scientific and technological services) mainly rely on work and employment models that aim at collective work organisation and individual employment regulation, that is, approaches that are characteristic of the knowledge economy. These propositions are based on various studies on the new economy (Lindkvist, 2005; Sydow et al., 2004; Benner, 2002).

3 METHODOLOGY

The methodology we chose involved qualitative research based on a comparative case study. This methodology helped to enrich and qualify the deductively constructed typology and to bring out the four work and employment models presented in Figure 3. Based on the preliminary and secondary interpretive propositions, we compared two cases: a company operating in a traditional sector and a company operating in a sector that is typical of the new economy. The first case study involved unionised knowledge workers in a large company in the energy sector, while the second involved non-unionised knowledge workers in a multinational company in the information and communication technology (ICT) manufacturing sector. Knowledge workers represented 19% of employees in the energy company and 30% of employees in the ICT manufacturing company. We sought to provide a rich and nuanced description of the work and employment models characterising the knowledge workers in each of the two cases.

In comparing the two cases, for data triangulation, we used two data collection methods that involved (1) conducting semi-structured interviews and (2) analysing official documentary sources. Interviews were conducted with various actors: knowledge workers, union representatives (if applicable), group leaders, human resource management personnel and trainers. We thus had access to a diversity of viewpoints. Thirty-two interviews were conducted with actors from the two companies – 20 interviews in the energy company and 12 interviews in the ICT manufacturing company.² The number of interviews conducted was fixed according to the principle of theoretical saturation, that is, the data collection ended when the addition of new data no longer enhanced the understanding of the phenomenon investigated (Yin, 2009). On average, these interviews lasted 90 minutes. Moreover, the human resource management personnel and the union representatives provided us with the relevant documentary material. We thus had access to corporate documents providing information on the profile of each of the companies under study and their current and future directions as well as internal documents relating, in particular, to policies, regulations and

² The number of interviews differed in the two companies because one company had a much more complex organisational structure than the other. More specifically, the ICT manufacturing company had a simple organisational structure composed of four hierarchical levels, whereas the energy company had more than 10 hierarchical levels. Moreover, the work and employment of the knowledge workers in the ICT manufacturing company were much more homogenous than was the case in the energy company.

practices. These multiple sources of information allowed us to present an accurate picture of the phenomenon investigated.

Data were collected using an interview schedule constructed by operationalising the two concepts examined, with questions provided for each of the concepts, dimensions and indicators included in our typology. Each of the recorded interviews was transcribed in full in a computer medium. The data were then coded using a grid including all the indicators proposed. The same grid was used for both cases, but the coding was done separately. This coding was then used in the content analysis and comparison of the two cases.

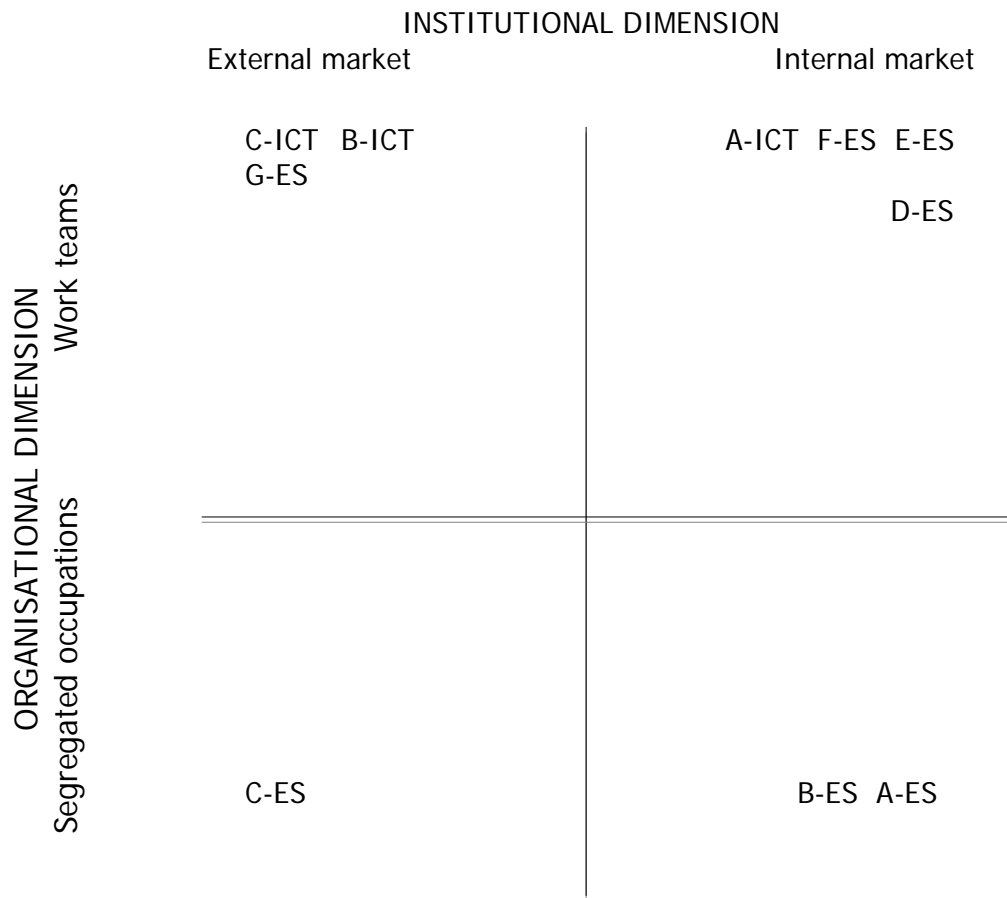
4 RESULTS AND DISCUSSION

4.1 Description of observed work and employment models

Different models relating to knowledge workers figured in the two cases studied. First of all, with regard to the organisational dimension, in both organisations, the technical and social organisation of work among knowledge workers was increasingly based on the principles of collective work, self-organisation and communication. However, these approaches were seen to a greater extent in the ICT manufacturing company since the energy company still relied on some traditional forms of work organisation. Moreover, with regard to the institutional dimension, the companies studied differed greatly in terms of the modes of employment regulation favoured. While in the ICT manufacturing company, an increasingly individualised approach to employment regulation appeared to prevail, in the energy company, the approach used remained largely collective. Figure 4 shows the different work and employment models that characterised the knowledge workers in the ICT manufacturing company (ICT) and the energy company (ES). The combination of various forms of work organisation and modes of employment regulation produced a series of models that were either unique to each company or shared by both companies.

Differences were most striking with regard to the organisational dimension. In fact, while the ICT manufacturing company was clearly positioned at one end of this continuum, having opted for collective forms of work organisation centred on multiskilling, knowledge sharing and autonomy, the energy company covered a wider spectrum and was positioned at different places on the axis. The latter favoured collective work for some categories of knowledge workers, but also maintained individual forms of work organisation. Thus, the models implemented in the energy company were more varied in terms of work organisation than those found in the ICT manufacturing company. These models involved traditional approaches inherited from the Fordist production paradigm as well as approaches that are characteristic of the new economy. However, it should be noted that, in the energy company, the knowledge workers were most often found within models referring to the traditional approaches to work organisation (models A-ES and B-ES) whereas in the ICT manufacturing company, the models implemented were instead based on approaches characterising the new economy.

Figure 4: Work and employment models identified in each company



With regard to the institutional dimension, the models implemented in both companies were positioned all along the axis, involving both collective and individual regulation modes. In fact, in both cases, the institutional dimension was characterised by both new approaches and approaches inherited from the Fordist production paradigm. It should nevertheless be mentioned that, in the energy company, the knowledge workers were most often integrated into models that relied on a collective institutional dimension, and were thus quite traditional (models A-ES and B-ES). In the ICT manufacturing company, the situation was more ambiguous, with most knowledge workers operating within a model that fluctuated between new and traditional approaches, although stability was promoted (Model A-ICT).

While the ICT manufacturing company focused on only one form of work organisation, the energy company adopted several forms and thus presented a greater variety of models than the ICT manufacturing company. As mentioned above, despite this greater diversity, in the energy company, most knowledge workers were concentrated within models that generally favoured individual work and a collective employment relationship (A-ES and B-ES). In the ICT manufacturing company, the majority of knowledge workers were concentrated within the model that combined collective work organisation with both collective and individual employment regulation, but encouraged workforce stability (Model A-ICT).

4.1.1 First case: Company in the energy sector

Model A of the energy company (A-ES) was very similar to the bureaucratic model insofar as collaboration between executives and designers was rather rare and the degree of task specialisation was high. A technologist explained the situation as follows:

"It has become so specialised. Before, 15 years ago, everybody did everything. We could work on any equipment. Of course, some people specialised a bit more because they worked in a given area more often. Some people performed better in some systems than others. But technology has evolved so much that the technologies are more and more specialised. It has become unthinkable these days to... [...] So, nowadays, you have people who are specialised just in telephony."

However, this model deviated from the bureaucratic model insofar as work was generally coordinated by the workers, either as a team or individually. With regard to the institutional dimension, this model also resembled the bureaucratic model since employment conditions were negotiated collectively. Moreover, this model was characterised by standard forms of employment. Furthermore, the employer was responsible for social protection and training. As regards remuneration, the negotiated systems were generally collective although individualised modes were sometimes used, in particular, remuneration based on individual performance. To sum up, with regard to the institutional dimension, this model was similar to the bureaucratic model. Model B of this same company (B-ES) corresponded in all respects to the preceding model in terms of work organisation. However, some modes of employment regulation were individual since the employer used fixed-term work contracts and the remuneration system could be individualised, bringing it closer to the self-employment model. However, this model deviated from the self-employment model with regard to a fundamental aspect since employment conditions were generally negotiated collectively. Moreover, social protection and training were covered by the employer, although to a lesser extent for the knowledge workers pertaining to this model (Model B) compared to the workers in Model A. Employment regulation generally took place within the internal market. Thus, Model B remained quite similar to the traditional model. Model C of the energy company (C-ES) resembled the model of self-employment. Work organisation in Model C was identical to that in the other two models (A-ES and B-ES). On the other hand, with regard to the institutional dimension, all the indicators were individual. Workers were not collectively represented in the workplace where they performed their functions, i.e. the energy company itself. Non-standard forms of employment were used since the employment relationship was tripartite. Thus, the company did not cover the workers' training, social protection or remuneration.

Model D of the energy company (D-ES) corresponded, in some respects, to internal project groups. In fact, with regard to the organisational dimension, work was coordinated by the team members. Moreover, links were created between designers and executives. For example, the link between coworkers in research and development and tradeworkers was explained by a technologist as follows:

"Those guys are more involved in the mechanics or assembly part. If our control system acts on their mechanics and things don't go as they should, we test it together. We go see them."

However, Model D deviated from internal project groups insofar as task specialisation was sometimes high even though the work was "team based." With regard to the institutional dimension, the modes of employment regulation were identical to those in Model A (A-ES) and were thus collective. The same was true for Model E of the energy company (E-ES) with

regard to the institutional dimension. The organisational dimension was also clearly collective. Model E thus was very similar to internal project groups. In terms of work organisation, models F and G of the energy company (F-ES and G-ES) possessed the same characteristics as Model E (E-ES). In models F and G, the organisational dimension was clearly collective, but employment tended to be regulated on an individual basis. In fact, Model G was identical to external project groups since all the indicators were individual, as in Model C of the same company (C-ES). Conditions depended entirely on the external market. As for Model F, although non-standard forms of employment were used and remuneration was individualised in part, employment conditions were negotiated collectively and assumed by the employer, and were thus set based on the internal market.

4.1.2 Second case: Company in the ICT manufacturing sector

With regard to the second company under study, the ICT manufacturing company, Model A (A-ICT), resembled internal project groups. In fact, work organisation was clearly collective and multidisciplinary. A participant described the composition of work teams as follows:

"It's a bit like an onion; there are several layers. There's a layer or a team in R&D that really works to develop the product. There's a manufacturing engineering team that specialises more in the production of the device. [...] There's a marketing person who takes care of all the market analysis and the marketing of the product. There are also people in the technical writing team who specialise in writing user guides, handbooks and those types of things."

Collective work organisation, moreover, applied to all the models implemented in this company. However, in terms of employment regulation, some aspects were less collective. In fact, although standard forms of work were used, employment conditions were not negotiated collectively by the knowledge workers and, in general, were managed on an individual basis. In fact, rules were set by the employer and, although they were written down in an employee handbook, they appeared to be rather vague, and individual negotiation of working conditions was possible. Moreover, although social protection and training-related expenses were covered by the employer, the workers were nevertheless responsible for developing their own skills and qualifications. Furthermore, remuneration tended to be individualised, in particular because of the systems related to individual performance. In Model B of this company (B-ICT), work was organised collectively while the modes of employment regulation were generally individualised. As regards employment conditions, the situation was thus the same as in Model A, except for non-standard forms of employment. Conditions generally depended on the external market. With regard to all these aspects, Model B resembled external project groups, but was not identical to them. Lastly, Model C of this company (C-ICT) corresponded to an external project group, since work was clearly organised collectively whereas the modes of employment regulation were all individualised.

4.2 Contrasting work and employment models: findings and analysis

The two cases studied thus confirmed our initial interpretive propositions. We first suggested that there are several ways in which the main components of the firm in the new economy can be configured, thus giving rise to the existence of different models. This was true for both organisations examined, with one presenting seven different work and employment models while the other presented three models. Two secondary propositions were formulated based on this finding.

First, companies in traditional economic sectors implement work and employment models that are characterised by a combination of new approaches and traditional approaches inherited from the Fordist model. This was true of the company in the traditional energy sector. In fact, the different models implemented in this company were based as much on collective as individual organisational and institutional dimensions. Thus, while traditional approaches were maintained, the company was also moving towards new practices. This situation can be explained by the fact that the company was founded during the industrial period and some of the practices adopted then had been maintained up to the present. On the other hand, with the computerisation of systems and the need to constantly innovate, the energy company had also had to ensure a degree of flexibility and shift towards practices promoting this flexibility.

Second, companies operating in sectors that are typical of the new economy, including the ICT manufacturing company, are mainly based on work and employment models that are shifting towards collective work organisation and individual employment regulation, i.e. the trends that are specific to the new economy (Lindkvist, 2005; Sydow et al., 2004; Benner, 2002), and are thus moving away from traditional models. This was true for the ICT manufacturing company which had adopted both new approaches.

However, this situation was more evident with regard to the organisational dimension. In fact, while the ICT manufacturing company had adopted approaches pertaining to the institutional dimension that are characteristic of the new economy, it had also opted for traditional practices in this area. Although no model presented entirely collective employment regulation, the dominant model, Model A-ICT, was nevertheless partly based on traditional practices. To sum up, new approaches existed in the ICT manufacturing company, with regard to both dimensions. Our interpretive proposition should however be qualified by pointing out that, as regards the employment relationship, regulation also corresponded to collective, thus traditional, practices. This situation can be explained, among other things, by the fact that, at the time of the study, skilled labour was scarce in the region investigated. The ICT manufacturing company had therefore adopted traditional employment regulation practices in order to retain hard-to-find expertise. On the other hand, the need to constantly innovate ensured that organisational practices were fairly flexible and that approaches that are specific to the new economy were adopted in this regard.

Results from the energy company and the ICT manufacturing company show that the characteristics of work organisation and modes of employment regulation were varied. They corresponded to traditional approaches, new approaches, or both types at the same time. The combination of these various forms and modes thus produced a series of models relating to knowledge workers that were identical to or different from the four pre-established models. Our results show more specifically that the forms of work organisation relating to the knowledge workers generally favoured a high degree of autonomy. In fact, in all the models, the knowledge workers could organise their work themselves. On the other hand, in each model, this autonomy was accompanied by some forms of control from the hierarchy. Therefore, it cannot be concluded that there was total self-regulation by the workers. However, the knowledge workers enjoyed a high degree of autonomy with regard to task execution and work planning. Supervision was flexible and the knowledge workers were subject to controlled autonomy (Ughetto, 2001). For example, an ICT company participant described a control tool used by the managers as follows:

"The project is defined in the Time Control tool. Then, there are a whole bunch of tasks [...]. So, people put their time down in the right places. Project

management, meetings... Did I spend an hour in that meeting? The hours are put down in the right places because this tool allows the project manager to see how much money has been spent."

For some knowledge workers, in particular those pertaining to models A and B of the energy company (models A-ES and B-ES), control appeared to be tighter. This control did not come from the hierarchy but rather from peers. The work of these knowledge workers had thus evolved in the opposite direction from that of the new economy. In fact, in their interviews, these knowledge workers revealed that they felt controlled by their coworkers, in particular through technology. As stated by one participant: "In some sense, I feel like they have, how can I put it, it's like they have authority over me. Yet, they're just coworkers like me." Nevertheless, despite the way work had evolved, the latter asserted that they enjoyed a degree of autonomy in planning their work.

Our results also show that the traditional separation between designers and executants has tended to diminish. Although in some models, relations between these two categories of workers were quite rare, collaboration was nevertheless possible, in particular when there were problems. Most often, this collaboration involved real exchanges since the executants could suggest improvements to the knowledge workers or work with them. Only models A-ES, B-ES and C-ES corresponded to the traditional approaches insofar as the designers were required to lead the executants or had absolutely no contact with them. Otherwise, in the other models, two-way exchanges were possible. Our results also indicate that the tasks performed by the knowledge workers were not always enriched. A deskilling of the work performed by some knowledge workers (models A-ES and B-ES) was indeed observed. These knowledge workers had had some tasks (diagnosis, problem solving and monitoring of operations), which required specific skills, withdrawn from them. Their functions had become more and more like those of executants even though they held all the qualifications required to perform more intellectual and abstract work corresponding to the functions of designers. The use of technology appeared, in part, to be the source of the problem. These knowledge workers could not exercise their skills because the tasks of identifying and solving problems had been appropriated by other workers who diagnosed these problems through technology. The organisation of work and the ensuing use of technology, much more than the technology itself, were at the source of this deskilling. This was how one participant explained it:

"Gradually, I'd say where there was a big change is really when remote management came in. I would have needed, as I said, whenever I intervened, I would have needed the normal rights to the system, passwords... Well, passwords more or less, but being able to unlock the system. It's me taking my place. I'll call you back when... Let me test some things. Let me... It's not a loss for the company to let me have an extra hour or two. I'll do that task this morning. I'll get to the end of the task and I'll learn more from it. I'll get fully into it. When I'm finished, I'll call the person in charge and tell him/her what I've done. That's more or less what I would suggest. But that's not how it works."

On the other hand, when organisational practices were based on multidisciplinary, task enrichment was observed. In fact, the multidisciplinary teams stimulated collaboration among the experts who were brought together to participate collectively in the innovation. Tasks were defragmented and reconstructed to make this collaboration possible. Team members had to mobilise and pool together their work in order to complete a final product. Contacts with other workers forced the knowledge workers to develop diverse skills and get

involved in a series of conceptual stages. In brief, task enrichment is thus not systematic in the new economy. The knowledge workers studied were as likely to be subject to a high degree of task specialisation as multiskilling.

As regards employment regulation, four observations can be made based on the different models relating to knowledge workers identified. First, our research results show that employment relations were shifting towards greater flexibility. In fact, in both companies, the use of non-standard work, in particular the tripartite employment relationship, was a growing trend, although it did not affect most of the knowledge workers in our study. However, North American legislation is unable to regulate these non-standard employment relations. Thus, the knowledge workers subject to these relations generally experienced a degree of insecurity and usually had less favourable employment conditions than permanent full-time workers. Our second observation follows from the first. The employers tended to assume fewer and fewer responsibilities towards the knowledge workers. The non-standard workers had access to poorer social protection. The other workers were also affected by this trend towards individualisation. They were responsible for their own training and were remunerated on the basis of their performance. However, this individualisation was not generalised since the employers still assumed several responsibilities with regard to the knowledge workers.

Our third observation is also related to the first. The work collective appeared to be weakened by the recourse to non-standard work and, more specifically, to the tripartite employment relationship. The employees of a subcontracting firm cannot join the certification unit of the user company. Thus, the more an organisation uses intermediaries, the more the number of potential members of the certified unions within the organisation decreases. Yet a larger trade union is generally associated with greater employee power, whereas a small number of members is associated with more limited power (Keser et al., 2004). In the energy company, the still limited but nevertheless increasing use of subcontracting thus resulted in a decrease in the number of potential members for the union representing the knowledge workers. The standards governing those working in the company were not all set jointly between the union and management, since some workers were subject to the standards set by their real employer, namely the subcontracting firm that had hired them. Similarly, although the employees of the subcontracting firms were represented collectively within another organisation, union power was divided since different trade unions represented the same category of employees working in the same organisation, but hired by different companies. Employment regulation thus remained collective, but the strength of the collective was threatened by subcontracting (Jalette and Warrian, 2002). Moreover, this break up of employment status raises the issue of fairness for individuals who perform the same work under different employment conditions (Bourhis and Wils, 2001).

Our fourth and last observation relates to the ICT manufacturing company. This company pertained to a sector that is characteristic of the new economy. Companies that are typical of the new economy are often described as organisations that innovate, particularly in the area of employment regulation. These innovations generally aim at flexibility in workforce allocation and entail an individualisation of the employment relationship. Personalised human resource management practices (Mercure, 2001) and an individual negotiation of employment conditions (Bacon and Storey, 1993) make it possible to meet the various needs and fulfill the aspirations of individual knowledge workers while fostering greater flexibility for organisations that must continuously innovate in a competitive market where technology evolves rapidly. However, the ICT manufacturing company appeared to have adopted this

approach only partly in dealing with the employment relationship. Although its human resource management practices appeared to be innovative, in particular as regards training and remuneration, its process of determining employment conditions remained largely traditional. In fact, the employment conditions of the knowledge workers in this company were determined unilaterally by the employer, and the workers did not participate collectively in determining them. They were represented neither by a trade union, from a traditional perspective, nor by an association, group or committee, from a more innovative perspective. It was possible for them to individually negotiate their conditions, but this situation was rare, even marginal. As stated by a team leader:

“We think that perhaps in some cases, it could happen, I know it's been done in the past, giving recruitment premiums, things like that. It could happen, really, if it's the last element that makes somebody hesitate. [...] It rarely happens.”

As a result, the great majority of workers were subject to an autocratic regime. Moreover, in addition to being autocratic, the regime to which the employees were subject was somewhat ambiguous. In fact, the conditions that had been pre-established by management were put down in an employee handbook. The various rules relating to employment conditions were indicated in this handbook. However, some of these rules were applied differently by management or were not understood or known by employees. To sum up, the model implemented by the ICT manufacturing company relating to employment regulation was quite far removed from innovative practices based on individual negotiation and was very similar to the traditional model in which conditions are determined unilaterally by the employer. It nevertheless also differed from the traditional model insofar as the rules were rather vague and depended on the prevailing economic situation and the state of the market at the time of hiring.

5 CONCLUSION

Finally, the different models relating to knowledge workers all differed to some extent and in some respects from the bureaucratic model. However, the new approaches were most often combined with more traditional approaches. Based on these findings, some unexplored research avenues could be investigated in depth since the results of this study cannot be generalised to all knowledge workers. Thus, it would be pertinent to complete this study with a quantitative survey using a statistically representative sample. Moreover, since the sector-based dynamics of the two companies under study most certainly influenced the results, the analysis of cases in other sectors is essential to bring out a more complete typology. It would also be useful for future research to examine the employers' motivations for adopting the different models, and their effects on social and economic performance. In fact, these issues have been overlooked here since our study results are limited to the development of structural configurations. It would also be relevant to conduct a follow-up study of the two cases examined in this research in order to report on the progress of the adopted approaches to work organisation and the employment relationship. Despite these limitations, this article contributes to drawing a detailed portrait of the work and employment models that characterise knowledge workers.

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