Round Table

Twenty years after –what can we learn from Volvo Uddevalla?

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Reflective Production as a means to analyse sociologically the other Production Systems and to develop a new social relationship

Michel Freyssenet

I would like talk about three points. Reflective Production as a means to better understand the structural inefficiency of assembly line and the productive models that use this machinery. Reflective Production as a means to design another type of automation. Reflective Production as a means to develop a new social relationship

1. Reflective Production as a means to better understand the structural inefficiency of assembly line and the productive models that use this machinery

The organization of production and work in the Uddevalla plant was not an organization which ‘humanizes work’ in the sense that it renders work in industry acceptable and even interesting. Nonetheless, in seeking to attribute ordinary human cognitive and cooperative dimensions to work activity, Uddevallian designers have elaborated radically new industrial principles which are applicable and perform under certain social conditions (as with any system), hence resolving structural problems inherent to the moving belt, used by all the other productive models, especially the Fordist model and the Toyotist model.

And more important: The Reflective Production system removes the loss of time inherent to assembly line, because it is impossible to completely balance the line. Finally the Toyota Production System was mainly a system to reduce this loss of time, but
without getting rid of the conveyor belt. The Toyotist model, if it is considered from the point of view of a pragmatic search for the primary causes of dysfunction by involving workers and their team leaders in the search, did not go as far as questioning the production principles which are at the origin of a large number of these very dysfunctions. Taichi Ohno, the designer of the main aspects of TPS, seems to have forgotten a sixth 'why'! He said that the workers must reconstitute the line of causes of each problem and so they sought to why five times. Toyotism attempted to reduce the economic consequences of structural problems linked to assembly line. The pressure that was put on workers to achieve this has, at present, forced Toyota to take a few steps backwards and reduce the workload. The Reflective Production System, by basing itself on cognitive principles and parallel production, eradicates structural problems that Toyotism has not sought to analyse and thus avoid.

Reflective Production manages to overcome practical obstacles used to justify assembly line activity. Reflective Production overcomes the fact that it is impossible to memorize a large number of operations, to feed parts into parallel work stations without obstruction and costly interruptions, and to instantly adjust tools for each different operation.

2. Reflective Production as a means to design another type of automation

Reflective Production has only involved assembly activity. Is it applicable to mechanics, pressing, sheet metal work, and painting, activities which are all highly automated?

In our opinion, at the assembly level, the Reflective Production System must be analysed as another automation strategy. In fact, all small added value operations are automated, that is to say handling and administrative tasks. On the other hand, that which is complex, costly, and premature to automate, i.e. materials handling and the assembly of vehicles which are increasingly equipped and varied, remains manual for the time being. However, Reflective Production would not have much of a future if it was set rigidly in the actual division between manual and automated activity. Hence, the question is raised as to how holistic principles could reorient the design of assembly and production automation in general.

Difficulties encountered in perfecting automated sections stem from the fact that they are designed, in both their mechanical and computerised aspects, with the objective of reducing to a minimum interruptions caused by dysfunction, and to do this it is necessary to have a predetermined estimate of incidents that could occur. However, unpredictable incidents are more numerous and frequent than expected. Rapid intervention by operators and repairmen to re-launch production as quickly as possible results in postponing and making other workers deal with the major causes of the dysfunction.

A holistic conception of work applied to the design of automated sections allows for the operators of the latter to practically and cognitively locate and participate in the analysis of the origin of fabrication hazards and machine breakdowns. It is by creating technical and organizational conditions which give the operators a general intellectual overview of the product and the automated process that one can hope to see a socially
‘anthropocentric’ form of automation develop, thus inaugurating a genuine and long-lasting social process in the reversal of the ‘intellectual division of work’ in automated workshops.

The firms have not only to consider their future with regard to their markets, but also in the light of skills developed by their workforce. Such a scenario presupposes a profound change in “employment relations” (particularly an increase power of workers on their work, on their professional trajectory, and on the enterprise strategy)

3. Reflective Production as a means to develop a new social relationship

Three social conditions have been seen to be necessary for Reflective Production. They also set limits to its expansion.
- Time allocated for each model and variant must be negotiated, because technical and organizational means which can impose a work rhythm no longer exist.
- The significant potential for improving the product and process and for reducing assembly time by assembly workers can only become reality if they do not also reduce employment.
- Finally, the collective dynamics of a genuine reversal of ‘the intellectual division of labour’ which thus comes about must be able to develop in an unrestricted way, which was not the case for Toyota, in order to make social compromise possible and to make the implication that needs last.

But the failure of all attempts to develop this type of production system leads to the conclusion that it is incompatible with capital-labour relationship. We know now that the free cooperation of persons can be more efficient that the work in capitalist conditions, as demonstrate for example the development of the free software and its capacity to compete with big software companies, the hegemony of Wikipedia in few years, etc....The current crisis could be an opportunity to find social relationships more friendly to Reflective Production Principles. What could be these other forms of social relationship? Utilities, public enterprises, worker cooperatives, associations, foundations etc. could be changed profoundly could be more efficient than capitalist enterprises, could be win the competition if they developed the Reflective Production Principles, that is to say if they reverse the ‘intellectual division of labour’.

Debate

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Michel Freyssenet: Certainly Uddevalla couldn’t be understood without the Swedish sociotechnical tradition, without Kalmar, and so on. At the same time it seems to me it is very important to insist that this is not a prolongation of the previous experiments. There is a correlation but at a certain point there is a rupture. Uddevalla is not an extension of Kalmar principles. It’s not an addition of more operations for each worker. It obliges to have a complete understanding of the architectural and functional logic of the product to assemble. The skills to do that are the same that each person makes each day to solve ordinary problems.
Michel Freyssenet: I would like to add two points concerning the automation and Reflective Production. First, the automation according Uddevalla principles is also a strategy of automation. The automatization is applied firstly to the few added value operations and secondly to the complex operations only when the concrete parameters of the process have been clearly identified and controlled by the workers. This first point leads to the second point.

Secondly, the knowledge and the skill developed by the workers themselves, identifying and controlling the numerous parameters of the concrete process, are knowledge and skill that engineers cannot have because they don’t work with the team. A very efficient cooperative work can be developed between workers and engineers, if this work allows to workers collectively to grow professionally. In this way, a reversal of ‘intellectual division of labour’ can begin. But to develop and continue until the cooperation between equals for more and more complex problems, it must be an objective for the enterprise after social negotiation.