The collective construction of space and activity dynamics, a performance issue

Nadia Heddad

University Paris 1. Formation Continue Panthéon Sorbonne FCPS. Ergonomics and Human Ecology Department

Abstract

This is a study concerns workplaces and is taken in a postal sorting environment. The target was to characterize the relation between space and activity. The aim of the research was to characterize relationship between organisation, activity and spaces patterns. Detailed observations were carried out in continuous 24 hours in 6 different postal sorting centres. Given the difficulty to track the important number and changing of work organisation during the 24 hours, the observations were equipped and enriched with drawings of the spaces during the activity. Topographical drawing on different time slots on 24 hours have given a kind of photographic record of the configuration of the work places as they evolve. Recording technology adopted is based on a combination of architectural survey for a performance of the building and surveying to represent the materials and travel agents. The objective was to account for changes in spatial organizations on 24 hours. This method was applied to three cases. An observation made with great detail from notes and sketches done on a place require to be completely updated a few hours later on the same spatial location. Sometimes, the work place was moved or disappeared a few hours later. Notes and drawings were done again. The result of this study shows that space and activity develop at the same time. One builds the other and vice versa. It also shows the function of space as an operating synchronizer in activity.

Practitioner Summary: (as for abstract, except begins after 1 blank line)

This reflection is based on an experience in sorting mail production process. Our work focuses the relationship between the spatial and temporal dimensions of work built by the collective activity of a group of agents as an answer for respecting the company's goals. It shows the close relations between space and work activity. The space for an activity is one that is built by the activity. It is the result of a specific process of the development of work activity of which it can't be separated.

Keywords: work, space, dynamic process, collective construction.

To introduce the subject, we propose investigating the space-work-organisation triptych from two points of view, being that of those who “manipulate” space through modification or design, and those “who experience it on a day-to-day basis” in their activity.

1. The workspace: an objective in projection processes

In workplace design projects, space is often projected as a static form, a container, a support, an envelope or a surface intended to encompass and contain a service or a production.

This is the point of view put forward by those that manipulate space. The project is one of an intended modification. It could equally be the transfer or grouping of services, the creation of an open space, etc. organised by a designer who could take the form of an architect or engineer, a senior manager, a property service, a general services department or a company’s purchases department.

The space providing the support for all activities is a vector able to affirm and materialise an intention. However, it is also the object of particular attention.
The intention is initially asserted by a clear desire to structure the mode of production. It concerns spatial organisation choices made to organise the physical layout of the industrial production or service. An organisational model is chosen through a spatial configuration. To meet organisational requirements, space is hierarchically organised, laid out and structured in accordance with a particular way of understanding how production is organised, how operations take place and, consequently, the tasks to be carried out.

Spatial configuration is never neutral. It translates the official framework within which the decision has been taken to organise a form of activity and is based on policy, managerial or organisational issues. In other words, the space is the result of an organisational model (linked to a way of thinking) that is translated into organisational principles that can be read in the building and thus in the resulting spatial form.

The intention also affirms a symbolic gesture, being the image that the company wants to express to third parties. The choice of an architecture is never insignificant. Be it high-tech or standard, a building does not put across the same message to the external world. Elevations, external and internal volumes (entrance halls, offices, etc.) are invested to express the image that the company wants to present to the outside world.

Consequently, the attention given to spaces also represents an interesting analysis key. It reveals the meaning attributed to space and its occupants. The care given to workplaces, expressed through the types of materials used and the furniture chosen, indicates the degree of attention paid to the activity being carried out. Treating various areas in different manners always bears a symbolic significance. A “front office” space visited by clients is often different from that of the “back office” where production takes place and where spaces are exclusively used by the personnel. Significant irregularities and subtleties in the interpretation of space and the place held by each person within the company organisation are made spatially visible, expressing what is not generally easy to present within an organisation.

In both cases, between the targeted intention and the given attention, the vision of the workspace is one of an objective to be attained. In other words, the targeting is organisational and symbolic when the vision of the space is handled as a means and a support for this change which all too often is static.

2. The workspace: a process in the work environment

While decoding intention and attention provides an understanding of the strategic aims of the modification, it does not however give access to the real organisation. This is because between the two lies the “work activity” whose analysis is a condition for understanding the real organisation.

The space created, adapted and experienced in day-to-day situations, especially in the work environment, is the space configured and laid out around the work activity by those working within it. This space, be it collective or individual, is manipulated by and for the work activity, and it precisely this aspect
that is of interest to us. It is another *genus* of space (Perec 2000) that is produced by the very act of working. It is the use that leads to the birth of this other type of produced space.

In other words, the process that an individual or a group introduces to *appropriate* a system (technical, organisational, spatial, tool, etc.) forming part of the work action can result in the premises within a company being occasionally used in a manner quite different from that initially programmed. This is particularly the case when there is a need to meet production objectives.

To account for this dual reading, we have organised our presentation around three case studies and based it on a cross-analysis, spatial analysis and work analysis. The approach taken to work particularly focuses on spatial representation. The spatial experience discussed here goes beyond the framework represented by the building which nevertheless remains a necessary support. It concerns the fundamental contents of the work activity work linked to the company's specific spatial organisation.

These case studies, whose common point is that they do not take work activity into consideration from an operational point of view, are nevertheless differentiated by the margins of manoeuvre left open to the development (deployment) of individual and group work activity.

The challenge consists in determining the dual relationship between work and space. Through these examples, we concentrate on work situations and the manner in which they are guided and induced by the space as well as by the way in which the space is structured, transformed and formed around the work activity.

3. **Space constructed by work, the case of a postal sorting station**

The case study concerned a postal sorting environment. The observation focused on the work space around the arrival bay of an old postal sorting station known for its production quality.

The setting, although relatively poor in terms of definition, had a few physical components positioned in such a way as to provide a large space containing a number of columns and a partition with doors giving onto the bay.

No particular attention had been paid to the spatial quality of this location, but there was a readable intention in the general layout of the premises and, in particular, in the openness of the volume and the positioning of the columns and partitions.

In their activity and with the help of lightweight mobile equipment, the agents organised a *work environment* that permitted the delivery and handling of letters unloaded by trucks. Within a specific space (the *work environment*) and time (an often short and tight time block), they sorted the post, homogenised the stock of letters that they directed and routed as and when ready to other treatment sites within the centre. Their layout within the space of the various types of mobile equipment in accordance with an order that they controlled, allowed them to organise the batches of letters into homogenous flows that depended on the category and priority of the product. The batches were laid out in space in the form of temporary stocks identified by typologies linked to the nature of treatment for each category (small format letter, large format...
letter, mechanisable, manual, etc.) and organised in accordance with a hierarchical priority treatment (the most distant destinations are handled first).

The space was initially used as a support to organise the work environment: the equipment was laid out in a certain manner (equipment placed up against a column, along a partition, etc.).

As and when the agents received the products, the space was progressively transformed to adapt to the flow volumes: the amount of equipment was adjusted and the floor space occupied according to requirements (increased size of the work environment, its relocation where required, etc.). The space became an integral part of the task to be carried out. In other words, the object of the work included, on the one hand, the received products as well as, on the other hand, the general spatial organisation of the work environment. At a given moment during the work flow, the two became one and the same. Direct action on the spatial layout became an integral part of the object of the work. The agents found themselves having to constantly spatially manage their work environment which became a means of carrying out the sorting in a manner guaranteeing the fluidity and efficiency of the sorting process.

Figure 1: State of a work environment at time "t" : work environment "constructed" in full activity
Figure 2: State of a work environment at time "t+1": Equipment stowed against equipment, "Remains" ordered.

Once the work was completed, the agents amended their space. The end of the work activity was physically manifested by the final storage of the mobile equipment, whether or not it contained products. The work environment could be dematerialised if all the traffic had been handled. It was laid out and organised around a number of containers organised in a certain manner if products that had not yet been handled (the remainder) remained in the mobile equipment. At this point, the work environment space became a reflection of the result achieved by the team’s work.

In other words, the agents organize the production in a spatial form that takes shape from the requirements and needs of their activity. The spatial form adopted then functions as a common operative repository (Terssac & Chabaud, 1990) that can be decoded by all agents who know the work to do. How to arrange the equipment and production space gives them access to an understanding on the current production status done by colleagues. From what has been achieved and what remains to be done.

The case study shows that space and activity develop at the same time. One builds the other and vice versa. It shows the function of space as an operating synchronizer in activity (Falzon 1994).

By structuring its work environment, the group of agents took possession of the space. Space was incorporated into its actions. The agents based their activity on the spatial structure and, more particularly, spatial irregularities, to construct their work environments. The loading bays, an external space, partitions, columns, etc. were used to organise the arrivals and departures of postal batches. In this situation, space is malleable, interiorised by the work teams. It is totally constructed and then deconstructed by the work activity.
To conclude and insofar as this case is concerned, space is initially a support, then an integral part of the production process introduced by the agents to carry out the work and, finally, transformed to become an indicator revealing the result of the activity.

4. Space, work and organisation

4.1 Space, a constraint or potential to improve work efficiency

In companies, the space manipulated during change processes (transfers, reorganisation, etc.) is all too often seen from a static point of view. This is despite the fact that in the work activity carried out by personnel, space, work and organisation constantly interact with one another. While work is a process supported by space, it also constructs that space.

When space is designed in such a manner that it contradicts the work requirements, it becomes a dictate to which employees must adapt. The efficiency of the system is then based on the capacity of the personnel to incorporate the spatial constraint and, over the long term, this can reveal itself to be highly negative in terms of individual and group work.

The design of a functional space that nevertheless does not fulfil all work requirements, especially those guaranteeing the efficiency of professional movements within a given sector, must necessarily leave a sufficient margin of manoeuvre to allow the operational organisation to create the setting necessary to assure the efficiency of the system. This demands spatial flexibility as well as the means to circumvent the lack of adaptation which need to be introduced at the same time as the design itself. It must anticipate the real working conditions that will be needed once the premises become operational. The case study concerning the paediatric emergency department revealed that the adjustment variable represents a specific type of work organisation.

In logistical activities, such as sorting work, space is simultaneously the support and the product of the work. It forms an integral part of the work process. The work is constructed around the space which, in turn, is constructed by the work carried out by the agents.

4.2 Space, a constraint or potential to improve work efficiency

The three examples clearly reveal that “space”, “organisation” and “work” are interlinked and complementary, while also being dimensions in a constant process of construction: the space is constructed by the work, the work is constructed by space which, in turn, reconstructs itself.
A process approach linking the three provides a detailed understanding of real working situations within companies. However, there are few fields or specialists interested by the combination of these three aspects. But, for people in real work situations, the three are interleaved and mutually influence one another.

In practice, various professions come into contact with one or another of these aspects. Architects are interested by space and the required organisation expressed by the client’s written intentions. Data processing departments and NITC approaches affect organisation and space without always taking all the consequences of their actions into consideration. Management, process planning departments and Human Resources directly affect the organisational and work aspects.

Finally, linking together the three aspects at the same time is not always easy for the various disciplines. To examine them in greater depth represents a real opportunity to open new approaches in the thinking concerning workplaces. Ergonomics based on a clinical approach to work situations can occupy this linking space, thus avoiding approaches that are too technical or functional when designing workspace.

References

Clot, Y. La fonction psychologique du travail. Paris PUF