



THE ROLE OF THE DESIGNER IN THE INNOVATION PROCESS: EXPERIENCE OF A LARGE SUPERMARKET CHAIN

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1. Introduction

Today, innovation is largely the result of an organised work and a collective process. In this article, we model the role of the designer in an innovation process by capitalising on the experience of the creation of a new checkout for a large supermarket chain. We emphasise the ability of the designer to co-ordinate innovative activity at an operational level, by visual and tangible means. In section 2, we describe the role of the designer as well as the tools he/she employed in each project phase. Section 3 places the project in the innovation transilience map, in order to show the contingency of the competencies mobilised and how they were organised. Section 4 concludes this article.

2. Contribution of the designer to "concurrent engineering"

The moment when the customers pay for the merchandise that has tempted them during their visit is critical for the supermarket. The quality of the service, consisting of offering a very large range of products at competitive prices, is nearly forgotten at this stage. The checkout constitutes a barrier which operates a brutal return to reality : here, the customer has to empty their trolley, parcel their goods and pay.

The SA firm adopts an overall approach when it is involved mid 1994 until end 1998 in a design project for its future payment desks. The objective is the desire to improve the working conditions of the cashiers; hence the project has a strong social dimension. To fully appreciate the importance of this project from the point of view of the managers, it must be noted that this category of personnel represents a third of the salaried employees of the firm. Their position is in a way comparable to that of a production line worker, where the objective is a high level of productivity. However the role can also be compared to that of a retailer due to the direct contact enabled with the customer.

One of the first steps taken by the firm is to contact institutions for security in the prevention of work accidents and for the improvement of working conditions to collect their opinion on the specifications. The firm obtains from these institutions a financial aid for the project, given the constraint of respecting certain methodological rules. These concern in particular the calling on consultants in ergonomics, semiology and design. The resources mobilised for the project evolve according to four phases.

In the **reflection phase**, the designer, member of a team of five persons (ergonomist, semiologist, and sociologist) brought together to observe the case, carried out a piece of research on the architectural, technical and functional aspects of existing products. Visits to the site allow them to collect information concerning the components present at the checkout; aspects related to the ergonomics of the checkout (even if in this project these aspects were the responsibility of the ergonomist, the designer had to learn about these in order to take them into account during the product development); the stages

of the customer's moving through the checkout (customer related and cashier related); the definition of the passageways and security imperatives and finally the signalling identifications.

Using this information, the team developed a report for the "checkout" illustrated by sketches. However, the expected result of the project is not the checkout. In the logic of the overall approach of the payment point, the conclusions of the designer were associated to the information of the other specialists in order to develop an overall direction for the project. In effect, the field study focused on the cashiers shows that their complaints concern just as much the work organisation and the modes of evaluation as the material conditions and the aspects generating physical problems. We stress the customer side was just taken in account by the designer and no specific study was done to clarify his/her needs. The project does not therefore limit itself to a change of furniture, the restructuration of the work of the cashiers is just as important.

Faced with the problem raised, which constitutes a technical, an economic and a social problem, very different competences prove to be necessary to the project. Two work teams are created:

- The «Commission 1» or «strategic team» having the decision making power. This group has the responsibility for the work organisation (e.g. timetables) and the taking into account of all the consequences which can generate a new concept of the checkout. It brings together a representative of the general management, to which institutional representatives are also associated.
- The «commission 2» or «operational team, has a mission to resolve all the problems related to the checkout furniture as an industrial product. It was composed of the director for shop service and innovation, who also assures the role of project head, ergonomist, sociologist, psychologist and designer, as well as a panel of eight cashiers and an internal working group bringing together computer and maintenance competencies. This team constitutes a collective actor, defining and giving a concrete form to the concept of a checkout which will satisfy the cashiers.

The junction between the two teams is ensured by the project head and the ergonomist who, by participating in the two commissions, search to conciliate the point of view of the general management and cashiers. Let us underline the decision making power of the project head (who is a director) and his involvement in the project, thus placing it at the heart of the collectivity. The organisational configuration of the project means that success depends for a large part on this person. In Figure 1, we place ourselves in the context of a model of the project and the project team, adapted from research in project management [Gidel 1999], which comprises three sub-systems. The designer assures the convergence of certain activities, relaying in this way the manager who intervenes principally at the level of the decisional system.

The **analysis phase** consisted for the designer of developing the research of ideas in the shape of a sketch, giving visual form to the ideas expressed by the ergonomist in the objectives framework. In this way, the designer develops a sketch book which proved to be very pertinent, making the specialists intervening react. The sketch book served as a co-ordination tool not only at the heart of team 2, but also between teams 1 and 2. The collective work of the set of teams led onto the writing of a specification principles framework, which differs from a true specifications reference by the non-fixed character of the objectives. The evolution of the objectives was necessary in these exploratory phases of the project. It offered the possibility of innovating, of playing the game of an overall approach, forcing oneself to imagine "something else" despite the very strong existing constraints.

Using the specification principles framework, the designer developed a conceptual approach to design. The idea was to search to limit a new territory for the cashiers, at the heart of which they felt safe: the «**island concept**» is born. Two cashiers share a double checkout post, each one assuring a form of protection for the other: back to back, inside the island, the cashiers feel safe in relation to the customer. Throughout this phase the designer interacts with all the members of both teams by developing sketches, sometimes made during meetings, as a tool of formalisation of the ideas provoked, thus helping to animate and orient the discussion.

The **development phase** marks the passage of the research and exploration of ideas on paper to their materialisation. The method retained by the designer was to work with life size proportions, making real scale foam models.

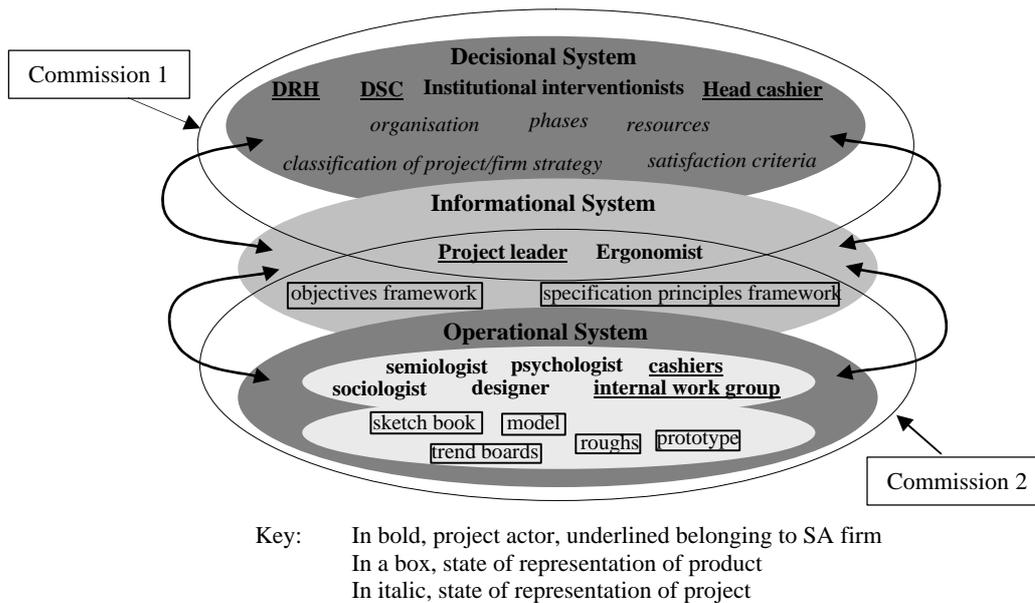


Figure 1. The management of innovation: the actors and what they produce [Gidel 1999]

This enables an easy mobilisation of the users of the future project but also a better evaluation of the complexity of the environment of the material. This simulation in space materialises a co-operative work at the heart of commission 2 and in particular between the designer, the ergonomist and the cashiers.

The validation involved the development of roughs as well as technical plans to give to the firm which will manufacture the checkout. At the request of the designer, the manufacturer was invited to take part in the validation meeting for the architecture of the future product, initiating in this way a partnership arrangement, conforming to a competitive organisation approach, new for the SA firm.

The designer created the trend boards, formulating the differing types according to varying environments, always associating written and visual information (photos, colours, forms). Constituting a form of summary of the expressed need, these trend boards enable to orient and justify choices.

To ensure the continuity of the design quality during the **realisation phase** which started by the making of the prototype-model, the designer obtained the possibility of accompanying the partner-maker in the making of the prototype. In effect a distortion between the prior design and the later design is manifested in all cases at the moment of realisation, even when everything is put to work to maintain the initial target [Midler 1993]. This quasi-discontinuity is based on a difference in value given to design.

However, having arrived at this stage, the project had undergone a strategic reorientation with the change of the project head. The experimental phase of association of materials is cancelled. The designer's intervention comes to an end and the carrying out of the project and last details are the responsibility of the project head in collaboration with the partner manufacturer.

The primary objective of the project, namely the improvement of working conditions of the cashiers in relation to the functional aspects and safety has been achieved (c.f. survey of satisfaction carried out at the moment of the project evaluation with 400 cashiers), but there was no survey of the supermarket customers, instead one of the questions posed to the cashiers was: "do you think that the customers are satisfied?"

We observe that the designer participates in all project phases. He/she manages the information flow in his/her scope of action in a visual and tangible manner in a great variety of forms by creating : sketches to help ideas to emerge and for energising meetings; roughs for illustrating the ideas to retain; models for evaluating the aesthetic, the technical and the functional product aspects and for reducing the gap between the founding concepts and reality; technical plans for enabling manufacture; and trend boards for planning and justifying the choices of colour and forms required. Such working methods ensure an *interactive design*, according to the expression of D. Quarante [Quarante 2001, p. 476], and

make effective the competition between the existing professions in the firm. Very often, as C. Midler has underlined, concurrent is reduced to a “confrontation of monologues” [Midler 1993, p. 125].

3. Determination of the competencies mobilised

To be able to evaluate the innovative character of the project and the project which was implanted in twenty supermarkets, we have established the innovation transilience map. Transilience, as defined by Abernathy & Clark [1985], is the innovation “capacity to influence the firm’s existing resources, skills and knowledge” (p5). The aim is of course to appreciate in particular the mobilisation of the designer in the innovation process. To begin with, let us point out that the outset of the project left a great margin to the project actors since:

- For certain, notably the ergonomist, the problem was clearly identified and relative to working conditions of the cashiers. No orientation however was imposed to find a solution (c.f. specification principles framework)
- For others, notably the project head and the designer, the problem identified was not the principal problem but rather the indication of the wish to change, to differentiate oneself, a wish susceptible to being confirmed through the determination of a challenger.

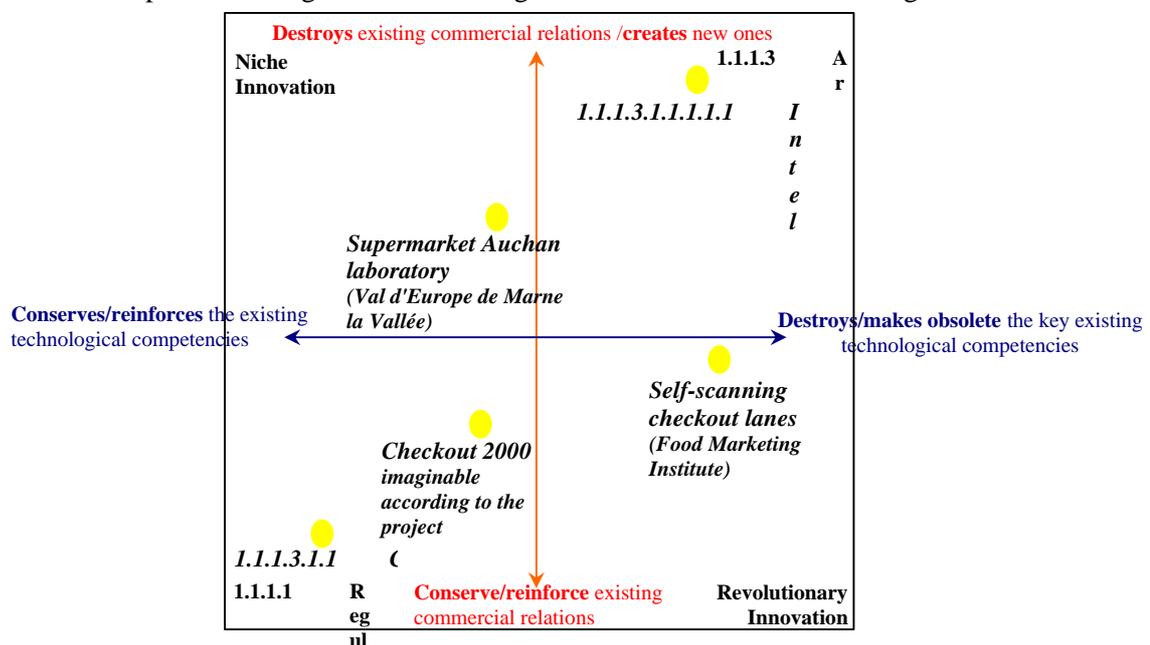


Figure 2. Innovation Transilience Map, adapted from [Abernathy & Clark, 1985]

We can place the final product (Checkout 2000) and the imaginable product according to the project in the innovation transilience map by situating them in relation to different solutions that a technological, competitive and commercial awareness enable to identify (cf. figure 2). There is, since the beginning of the 1990s, some reading-writing technologies that may dematerialise the barrier currently marked by the checkouts like the MIT intelligent label project. This solution would constitute an architectural innovation. Other solutions continue to use bar-codes but reinforce the traceability in real time of the product from its manufacture, its release onto the shelves and then its departure from the shop (Self-scanning checkout lanes). The project of the renewal of the large supermarket concept (supermarket Auchan laboratory) was also identified, where one of the innovations concerning the checkouts is a set of panels indicating to the customers the language spoken by the cashiers.

In the project analysed here, the idea which oriented the work of the designer is a current innovation which is situated relatively at the centre of the map, since:

- It introduced a number of ruptures on the components of the structure of the checkout (island, materials and numerous points not cited in this article). These existing technological competences related to the checkout were questioned,
- The relationships with the providers were also questioned in relation to current practices,

- Finally the acquisition criteria of the checkout correspond to an innovative demand by the place given to social aspects in the very hard economic culture of large distribution: accept two cashiers in the same island is to take the risk that they "chatter" etc. On the other hand, seeking to make the post more pleasant and comfortable for the customers of the payment point conforms to the general tendency of large supermarkets. It is clear that the SA firm has not seized the opportunity of this project to differentiate itself in a clear way from its competitors. It did not go as far as seeking to value the payment point with the clientele (as the absence of elements in the survey shows). The payment post is part of service provision. Carrying out a regular innovation on the checkouts, the firm assures that it doesn't degrade its provision. It seeks its competing assets in other sectors. It is certain that with results from projects such as that of MIT, the big shops which equip themselves will play this card in relation to their customer, and will mobilise considerable marketing competencies.

The «checkout 2000» payment point realised does not incorporate all the possibilities explored and constitutes a regular innovation with the least rupture technologically speaking than that envisaged during the project. In effect the concern of the designer to assume the role of users' spokesperson, both for the cashiers and the customers, is very clear in all the sketches and the propositions emitted. They have not however been retained. The orientation chosen by the management explains in part this observation, in the same way that it explains first of all the presence of the designer but the absence of the marketing competence in this team but also the importance of the ergonomist. In effect the "objective of marketing in the firm is to optimise the relationship with its customers and to satisfy their needs. In theory therefore, design and marketing share the same state of mind or preoccupation of the customer but from an angle of complementarity. The designer reasons in terms of creation of visible difference and therefore of market, of product and identity concepts and enriches the differentiation strategy and positioning of marketing on the behaviour of the consumer whilst working on the building of other methods of research." [Borja de Mozota 2002, p.101]. This competence would therefore give some weight to the proposition of the designer, situating the needs of the cashiers in relation to those of the customer.

The fact that the general management places the ergonomist at the junction between the two commissions to assume this role of influence on the operational system and the decisional system, lets us specify first of all that the designers and the ergonomists have very close primary concerns: the improvement of the relationship user/product. [Quarante 2001, p. 475 - 480].

However the request addressed to the ergonomists is often "limited to simple corrective effects of an existing product." In this way the general management signified its preference for a regular innovation, in the same way that it encouraged the ergonomist to centre his/her efforts more on the improvement of the work post of the cashiers (routine activity) rather than on the use of the checkout by the customer. "The difference (between the two actors) only comes in at the moment of materialisation." The ergonomist seeks to constitute "a dossier of recommendations and prerequisite studies indispensable to the correct materialisation of concrete solutions." Then he transmits this information to the designer. The designer holds in effect his double role: that of **decoder** who collects, analyses and reformulates the problem posed, and that of **summariser** who digests and returns the information in the form of a practical, original and adapted response [Bauhain-Roux 1992]. In this passage to the material form, which is translated by the project, the designer therefore becomes the **ambassador** of the project in the firm. It is for this reason that the designer favours the contribution of all the functions to the realisation of a competitive advantage and provokes a debate on the facts and the questions very early on, in order to generate a consensus for the later phases [Borja de Mozota, 2002].

In this project Checkout 2000 we see the strategic importance of the organisation chosen in relation to the final result of the innovation. The composition of the commission 2 - which notably integrated eight cashiers and no marketing personnel - shows how important the choice of job category to be mobilised in the innovation process is contingent to the category of innovation desired. In this way if the designer had a stronger position and so occupied a role of influence, he could inflect the project towards an innovation more coherent with the market evolution in the supermarket domain, placing the project closer to the innovating extremities [Abernathy & Clark, 1985]. mode

4. Conclusion

This project, though it was largely initiated to resolve an ergonomics problem concerning a work post, shows the **role of a designer in the various kinds of exchange (e.g. models, roughs) and even co-operation between different actors necessary for the project**. With their ability to make visual and materialise the discourses, to adapt the functions and establish the use scenarios, the designer develops a strong potential of "seduction". They support the effort of a collectivity to imagine what doesn't yet exist but could well exist one day. They are at the heart of the convergence of the activities of the operational system. Even though the designer had created tools (sketch book, models, roughs, trend boards) that aided that convergence, his/her point of view was not so important in the co-ordination of the teams, a role essentially played by the ergonomist. However, in the experience capitalised in this big supermarket firm, it appeared that the designer benefited from a considerable "seduction power", essentially in the exploratory phase of the project. In projects where the designer occupied a place in the decisionnel system, such as the Twingo car [Middler 1993] and the Dyson's DC01 vacuum cleaner, results were closer to the initial ideas and new concepts.

In the search of possibilities, the designer balanced an approach focussed on the structure and the function of the product that P. Dormer termed « under threshold design » and which he names « upper threshold design » which concerns more the style and the visual aspect of the product making the very different specialists react and proposing syntheses.

Finally this case shows that each type of innovation required a different organisational and managerial context and consequently different competencies [Abernathy and Clark 1985, p. 41].

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