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**ONZIEME RENCONTRE INTERNATIONALE DU GERPISA
ELEVENTH GERPISA INTERNATIONAL COLLOQUIUM**

Les acteurs de l'entreprise à la recherche de nouveaux compromis ?
Construire le schéma d'analyse du GERPISA

Company Actors on the Look Out for New Compromises
Developing GERPISA's New Analytical Schema

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ASSEMBLING TOYOTA IN PORTUGAL

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A lot has been written over the last decade with regard to Toyota and the productive model associated to it (*toyota-ism*). And more specifically concerning the "(...) best-seller that changed the... sociological world." (Castillo, 1998: 31). But the case of Salvador Caetano's Ovar Industrial Division (OID), that assembles Toyota light commercial vehicles in Portugal, allows us to put forward a sub-hypothesis that fits into the analysis schema proposed in the First GERPISA International Program – "In short, GERPISA members considered that the plurality of models was much a plausible hypothesis deserving testing as that of the diffusion of a unique model (...)" (Boyer, Freyssenet, 2001: 42). So we add: and within Toyota itself, is it not true that different productive models co-exist – especially when delocalised – depending, amongst other factors, on the degree of Toyota participation – in terms of capital and technology transfer – in the local company (strong or weak) and on the markets to be reached (internal or external)? If so, what work system can we expect to find in a plant that presents such peculiar characteristics as this one?

SALVADOR CAETANO'S OVAR INDUSTRIAL DIVISION

In the North of Portugal, as part of Salvador Caetano, OID started to assemble vehicles in 1971. This industrial unit is divided into two industrial modules. Module 1 – the subject of our case study – currently assembles two light commercial vehicles: Toyota Dyna and Hiace. Its maximum productive capacity is 60 vehicles per day. But, at this time, only 15 vehicles per day are assembled, about one fourth of what is technically viable.

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Productivity (1971-2001)

In general, an amount of 200 thousand vehicles per year is indicated as the goal to be reached in order to guarantee competitive economies of scale in terms of costs. Obviously, OID does not follow this rule. In figure 1, the darkest line indicates the annual production of all light vehicles over three decades (1971-2001); the lightest line, only the Dyna and Hiace models (taken together).

In general, the history of this industrial unit has been characterised by successive high and low points. Nevertheless, the values are invariably low: in the first year (1971), 3,725 units; in the most productive year (1988), 13,483 units; and in the last year (2001), 3,845 units, only 120 units more than at the beginning. Also for that reason, core activities take place during the first four working days of the week. The fifth day is programmed for organizational and cleaning tasks. And there is a single working shift (working from 07:00 to 15:45).

In 1979 there was a re-conversion of the assembly line and commercial vehicles then took over 100% of the activity, based on a scarcely ambitious technological strategy. Even today the vehicles are (literally) pushed by hand from one workstation to the next. Only in the painting area we found a chain on the floor working autonomously. Also, there is not a single robot. As for a hypothetical automation of this plant, the investment needed is so high that for this level of production the ratio cost to benefits means any step in that direction is unfeasible from the start.

In 1997, and following a gradual reduction in the diversity of models assembled, production was limited to the Dyna and Hiace models, to the present day.

Production cycle

The production cycle starts with the opening of the CKD material supplied by Toyota from Japan (by sea). There follows a series of steps in the welding line using *jigs* to put the parts into place correctly. Then the vehicle is analysed and the defects on the metal plate, if there are any, are rectified. It goes on to the painting area which consists of eight steps more (pre-treatment of the metal plate, painting by galvanization, application of sealers and PVC, priming coat application, paint sanding, enamel painting, inspection of the painted surface and shaving). When painting finishes the vehicle goes on to final assembly where the CKD components are assembled together along with the local incorporation components. During the final inspection all the defects are rectified. A last test is carried out on the brakes and an anti-corrosive wax is applied to the chassis. After that the vehicle is available for the commercial services.

Workforce

At the end of 2001 OID had 389 workers, 25 of whom (6.43%) had fixed term contracts. 337 men (86.63%) and 52 women (13.37%). The average age, 41 years old, is high but tends to decrease due to early retirement packages for the older population. In terms of seniority, 128 people (32.90%) are working for 25 to 30 years in the plant (therefore, a large proportion of the employees remains there ever since the beginning of its activities). Education levels are markedly low. 146 people (37.53%) have no more than four years of schooling. And if those with an extra two years of schooling are added to that group (six years), a total of 268

people is obtained (68.89%), more than two thirds of the population. At the other end, only 18 people hold a bachelor or a university degree (4.6%).

"Ten years ago, the people who got to be heads of section at the most would have done an industrial course, not even that. The next ones who become heads of section cannot have only those qualifications." (production manager)

The average absenteeism was 9.16%, which means that 62,289.5 hours of work were lost in a universe of 712,676.0 working hours. Throughout the year of 2001 there were 16 training courses internally. 675 people were involved in these courses for a total of 7,943 hours, which is equivalent to an increase of 55.99% with respect to the previous year.

LOCAL PARTICIPATION AND MARKETS

One interesting question is related to the degree of interference of Toyota in the local organizational model. Which is quite small. In order to understand the reasons for this option it is interesting to view this plant within the context of all the plants that manufacture or assemble the same models throughout the world.

Table 1. - *Toyota worldwide manufacturing companies (Dyna and Hiace)*

Country/location	Name	TMC-related equity	Products
Venezuela	Toyota de Venezuela Compania Anonima	TMC 90%	Corolla, Dyna , Land Cruiser, Terios, engines
Portugal	Salvador Caetano IMVT, SA	TMC 27%	Dyna , Hiace , Optimo
Kenya	Associated Vehicle Assemblers Ltd.	TMC 0%	Dyna , Hiace , Hilux, Land Cruiser
South Africa	Toyota South Africa Motors (Pty) Ltd.	TMC 74.9%	Corolla, Dyna , Hiace , Hilux, TUV, engines
Indonesia	PT Toyota-Astra Motor	TMC 49%	Camry, Corolla, Dyna , Soluna, TUV, engines
Malaysia	Assembly Services Sdn. Bhd.	UMW Toyota 100%	Camry, Corolla, Dyna , Hiace , Hilux, Land Cruiser, TUV, engines
Taiwan	Kuozui Motors, Ltd.	TMC 51.7%	Camry, Corolla, Tercel, TUV, Hiace , engines, parts for press and assembly
Thailand	Hino Motors Thailand Co, Ltd.	Hino 34% Thai Hino Mortor 6.9%	Dyna
Vietnam	Toyota Motor Vietnam Co, Ltd.	TMC 70%	Camry, Corolla, Hiace , Land Cruiser, TUV

Source: adapted from Toyota Corporate Information

The first observation to be made from table 1 is related to the weak participation of Toyota in Salvador Caetano, which is limited to 27%. We believe that if this industrial unit belonged mostly to Toyota (and not to Salvador Caetano) it would be able to count on a five or ten year strategic plan, which is not the case.

The assembly line has been active since OID was inaugurated. This was the solution found to overcome the restrictions imposed for CBU vehicles. Apart from that, and taking into account all the factories that manufacture or assemble these vehicles, we find a common trend: cheap labour. In fact, compared to EU countries, Portugal has labour costs that are clearly lower than the average: the labour cost is 8.13 euros/hour in Portugal and 22.7 euros/hour on average in Europe (about a third).

This has been a decisive factor in attracting foreign investment to Portugal, namely from Japan (cf. Sachwald, 1993: 67). It just so happens that this competitive advantage tends to be insufficient in the global arena: "If we still benefit from some positive margin (?) when we are compared with the European industrial giants, the fact is that countries like the Czech Republic or Poland not only have low cost labour but another advantage quite as important: geographic proximity with respect to the large European markets, which leads to a reduction in distribution costs. This is why the countries in Eastern Europe are starting to host new projects, making it more difficult for countries in peripheric regions to attract foreign investment. Of note the recent case of Volkswagen's Palmela factory which lost to Slovakia the production of the new Porsche model – the cost of hourly labour in Bratislava is 60% lower than that of Autoeuropa." (Machado, 2000: 64)

Another element to be taken into account is related to the markets. Production in OID is exclusively aimed at the (small) internal market: "(...) if the product is, in great part, pointed to the internal market the comparative advantage should be in the low cost of wages and in smaller technological and organizational investments (the cases of Renault-Setúbal or Volkswagen-internal markets in Croatia or Mexico); if, on the other hand, the production is pointed to external markets there is a great concern regarding technology and work organization (as in the cases of AutoEuropa-Setúbal, SEAT-Martorell or Volkswagen-Mexico-external market)." (Moniz, 1995: 14)

In addition, commercial vehicles do not seem to be a priority for Toyota. Actually, the main investment has been pointed to the Carina and Avensis (England), Yaris (France) and Corolla (Turkey), and that way Toyota covered Europe. The distributors themselves, it is believed in OID, seem to be less motivated to sell commercial vehicles.

In summary, all these external factors should to be taken into account if we want to better understand the weaker intervention of Toyota in the local organizational model.

WORK SYSTEM

Nine decades after the introduction of the assembly line into the automotive industry many of the elements that were part of the fordist productive model are kept intact by a large number of companies. Within this framework, and in spite of the diversity of strategies developed by automobile manufacturers (Boyer, Freyssenet, 2002), the choice for differentiated, qualified, enriched labour, is still uncommon. And *toyotism* did not change this trend. On the contrary.

In fact, one of the main features of *toyotism* has to do with the pressure put on the workers. Toyota representatives (headquarters) feel that in OID this pressure is practically non-existent. Some extra pressure is therefore defended by Toyota for this plant. It is quite interesting that the Japanese insist on this point. Because the pressure suggested here is not understood as an inevitable consequence of the need to produce more or to react to the needs of the market (downstream). On the contrary, it is recommended as an organizational tool (upstream), supporting the hypothesis that lean principles do create intensified work and demands.

Within the framework of the diagnosis of the work system, and because it is almost a pattern in the automotive industry (together with one other: the one-minute time cycle), we were interested in analysing the tendency to prescribe times – "The stopwatch went into the shop-floor: no doubt the greatest revolution in the human history of production has begun." (Coriat, 1994: 12) – and motions in the shop-floor.

Times

The times predicted to carry out the tasks are usually determined in function of the equipment, explained the production manager. For example, if it is necessary to apply ten welding points onto a part and if the machine is capable of applying a point every two seconds, then the time predicted for the ten points to be welded is calculated (20 seconds). This is, of course, a typical example of technological determinism. In any case the stopwatch does not seem to be equally precise in every step of the process:

"Nowadays, in the assembly line it is just that [prescribed times]. In painting, as there are certain things that sometimes do not go so well, such as a drop of grease for example, we need to have a certain margin to manoeuvre in order to recover. Because if it is calculated precisely with a stopwatch, anything that goes wrong can never be put right again, isn't that so?" (painting group leader)

"They [in the assembly line] work more based on the stopwatch. Not here, since it depends on the flow of vehicles coming out of final assembly." (final inspection worker)

As late as 2002 a new method for time measurement was introduced, based on a study carried out by Toyota. Table 2 shows the standard times calculated to carry out operations. These times are then compared with those observed during filming *in loco*.

Table 2. - *Standard times vs. times observed during filming*³

Station	By-Pass & Overhead Hiace					
	Model					
	201W	211W	HIACE	201W	211W	HIACE
Standard Times (min.)			Filmed Times (min.)			
1BH1	–	–	58,88	–	–	49,50
2BH1	–	–		–	–	46,50
1OH1/2	–	–	29,05	–	–	29,00
2OH1/2	–	–	22,16	–	–	32,00
SOH1	–	–	13,30	–	–	24,00
1OH3	–	–	25,36	–	–	39,00
2OH3	–	–	25,76	–	–	37,00

Source: *Salvador Caetano*

³ Filming took place in July 2002. It is possible that the times registered have in the meantime been altered.

The proposal made by the Japanese (and accepted by the locals) is to adopt new standard values. The aim is to develop a model that is more easily measured in order to optimise times. But one other reason, known by all to be dear to the Japanese, is to disinvest in operations that do not bring any added value. Within this framework, if it is foreseen that it takes a certain amount of time for a worker to tighten a screw...

"... I give him no time to go and get the screw." (production manager)

This method, if inscribed within a logic of continuous improvement, could promote the search for small improvements (looking at the last statement, bring the screw near the worker in charge of tightening it) and, this way, also reduce some waste. On the other hand, if this strategy is taken on its own it might raise new problems. It is worth noting that in OID there is not a methodical rotation of tasks. Well, if job rotation is not systematic, when a worker is forced to carry out the tasks of a colleague it becomes difficult to keep up to the standard times with the same degree of efficiency.

"There should be rotation so that we can operate in every workstation. If you stay several years at the same workstation it becomes difficult to be able to do other work. And if, for example, a colleague does not come in I have to complete his/her task within the same amount of time... I think this is a problem." (final assembly worker)

We are obliged to underline the perspicacity of this last statement. If nothing else because it contradicts those who, perhaps still inspired by the Principles of Scientific Management (Taylor), believe that blue collars should not be allowed to think about the work they carry out. After all, the words of this final assembly worker show a dysfunction formerly identified by Boyer: "(...) the choice of organizational mechanisms is not continuous but discretionary, since the efficiency of a management tool depends either positively or negatively on the presence of another tool (whether it is complementary or antagonistic)." (Boyer, 1998: 7)

In any case, and in spite of the recent tendency towards a certain *japanization* in timing control, we were left with the clear impression that the worker's "free time" was still relatively long comparing to lean production standards.

Motions

Globally, and that is also a trademark of this industry, motions tend to be repeated in a systematic way. Also in this plant the working procedures are perfectly predicted. At each workstation there are detailed procedures for each of the operations to be carried out. But once again there are two areas that due to the nature of their activities seem to be less restricted by that regulation: painting and final inspection.

"There are jobs that cannot be written up. Sanding tasks, for example, which depend more on learning and experience." (painting group leader)

"The work at the assembly line is more tiring because you are always doing the same thing. Not here. It is not a routine job." (final inspection worker)

The workers can look for ways to optimise the work within the framework of the recently introduced *kaizen* activities. In this preliminary stage, these meetings involve a restricted group gathering together mainly the personnel linked to assembly.

It is known that a continuous improvement strategy can contribute to optimise production and/or quality levels and – why not? – the quality of working life. Nevertheless, this solution seems to be limited in as much as (a) improvements should not lead to an increase in predicted times; (b) when a solution is presented, the decision to adopt it is held by the managers (which means there is no delegation); (c) it takes place outside the regular working shift (extra time). As so, increases in autonomy tend to be modest.

"I have been told, by a head of section, that I was only here to work and push the car forward. We are the working machines." (final assembly worker)

Recently a document that identifies the skills of each worker to carry out one or more jobs was also developed (workers multi-skilled operations). This might become an interesting tool. For the company, in order to avoid bottlenecks caused by the incapability of allocating workers to different workstations quickly and without loss of efficiency; and for the workers as well, since (at least in theory) it can contribute for a daily work that is less repetitive and monotonous.

The letters at the top of the document identify the workstations. The circles indicate the degree of knowledge of the worker with regard to each of those workstations: 1/4 of a circle, training period; 2/4 of a circle, reasonable knowledge; 3/4 of a circle, reasonable knowledge as well as some experience; 4/4 of a circle, complete knowledge of the workstation and completion of tasks within predicted time.

Both the *kaizen* procedures and the workers multi-skilled operations are very recent initiatives, which means that it is premature to try to draw any reliable conclusions at this stage. Actually, a reward plan is not yet defined for both cases.

One other indicator that is interesting to look at is related to delegating on the workers the decision to interrupt (for their own) the production flow. But here the person responsible for interrupting the process is the group leader, supported by the head of section.

"There were people on my side that were called to go to the other side to help and then I was short of manpower; I sent as many as possible to the other side and then gave instructions to stop. Otherwise it would get stuck on both sides. [And if you were not group leader, would you be authorized to take that decision?] Oh, no, of course not." (painting group leader)

The workers will not interrupt the flow except in case of absolute necessity (for example, in a situation that places at risk his/her health or that of a colleague). Apart from that the normal procedure is pushing the decision onto a higher hierarchic level.

A NEW INVESTMENT?

A new Toyota investment in Portugal (again associated to Salvador Caetano) is under consideration. It is expected that it will be a larger and more ambitious project, within an export strategy.

"[The future] will necessarily be whatever Toyota means to do with us in terms of exports. If there are no exports, there is no future." (production manager)

Even though some progress has been made, this new investment is far from being guaranteed. It is an old claim, considered the most viable solution to re-launch the factory at Ovar. There is therefore a clear effort in order to make Toyota believe that this plant and those that work there meet the basic requirements to export. What seems to be interesting here is the fact that this project is already having repercussions on the organizational model of OID.

"Considering some of the agreements made and situations which will put things into perspective for the future, we really have to move towards zero defects (...) [an objective on which] our near future depends." (quality manager)

It is not by chance that only recently some of the organizational features usually associated to *toyotism* have been adopted. As we mentioned earlier, a new method for time management, the gradual elimination of activities that do not bring any added value and *kaizen* activities. In any case, in this *hybridisation* game starting now, there are certain aspects of the *Japanese management* that may perhaps clash with local practices.

"There are things we cannot easily copy or accept. We have to see what we can adapt, knowing the reality we face." (human resources manager)

So what about zero stocks and zero defects goals? In OID the stocks of raw materials have a two week target. As for components, of course there is a minimum amount for orders and, since production is small, there is an increase in the retention time of those components in stock. The objective for the CKD material that arrives from Japan is three weeks. It seems obvious that for such a reduced production level investing in a *Just in Time* strategy (with the corresponding implications in terms of geographic re-localisation and the establishment of dependency amongst companies) is not attractive to any players who might possibly show an interest.

"Just in Time cannot be something created by us, it has to be developed by everybody and preferably by a country." (production manager)

It is well known that Toyota (and nowadays the automotive industry in general) also sets a zero defects objective. As for the procedures to reach that goal they are up to the local plant and the routines to improve quality ought to be developed internally. In OID there is a quality control point at the end of each area. There is a division of responsibilities between

control (production), rectification (quality) and park auditor checks (carried out at random on one vehicle per day). In total, the activities related to control, rectification and auditing involve ten people. In comparison with about two years ago, defects have diminished by more than 50 per cent. The quality manager predicts that Toyota values will be reached.

FUTURE(S)

Within this state of crisis, OID has always tried to find small solutions (beyond the core activities) to help turning the business more profitable. In the painting area we found a surprising case: side by side with the normal productive flow, there were parts being painted for another automotive brand. Actually, for a competitor. These are parallel activities aimed at helping to bring profits to a business that has seen better days. Strangely enough, the Japanese do not view this situation as problematic at all.

Employment is a well know concern in a company that persists in assuming a strong social responsibility. That is why, throughout the last three decades, several strategies were found to overcome the problem of overstaffing. For example:

"In the crisis of 76 we had eighty people for whom there was no work. We thought: we produce Dyna here which then go away to make freight boxes. We have land behind this factory, we will build a new plant, we will make the freight boxes ourselves and those eighty people will go on to that industrial unit. The foundations, walls and roof, the whole factory was built by those eighty or so people. We had painters, metal workers and mechanics laying bricks, putting up walls, etc. From then on, the freight boxes were made there and we ended up by solving the problem of the extra eighty people." (human resources manager)

In fact, Salvador Caetano still retains a very considerable amount of trust by its workforce, which is more and more an uncommon situation in the industrial scene. In other words, in a period when so many companies are closing up declaring bankruptcy (and very often starting up again next door) there is still the belief that this industrial unit has a future. Let us see:

"I think this company, if it manages to maintain the spirit that it has had so far, will not have continuity problems. Because it was moulded a bit around the following concept: the company creates jobs, the people who defend those jobs are those who work here. (...) If it is not cars, it will be something else." (human resources manager)

"I started here 17 years ago and on the very first day I was told the company was in a state of crisis. If this closes up we can assemble something else. From my point of view, I think it will carry on." (final assembly worker)

After all, what we find in Ovar is an industrial unit that has been active for more than 30 years and that has got stuck in time. There are obvious inadequacies at the technological and organizational levels. Formerly a leader in the internal market of commercial light vehicles, it seems that OID has reached its technical and economic limits.

"From a point of view of economics, this factory has not been viable for a long time. We have all been aware [of that] for several years. It exists, not exclusively, but fundamentally, because of a very strong concept of responsibility that this company has always had, believing that a solution will be found in the future." (human resources manager)

CONCLUSION

According to the "analysis schema of the GERPISA" which is now under discussion, we ought to consider several categories of analysis: "(...) naturally, the employment relation, but also the productive organization and especially the company governance and the labour uncertainty." (Freyssenet, 2003: 7). This case study was developed in the light of these concerns. As so, and going back to the initial question, it seems clear that the degree of Toyota participation – in terms of capital and technology transfer – in the Portuguese company is rather weak. At the same time, the market reached is basically national, therefore small. These factors, amongst other ones related to the historical, cultural and institutional background of OID, do interfere with the format and the nature of the work system that was developed locally. But until otherwise demonstrated, OID, which is clearly a non-lean plant, still deserves the trust of such a demanding carmaker as is Toyota. And also of those who perform their daily work at the assembly line.

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