A CASE OF SUCCESS

The impact of *ad hoc* teams in the automobile industry

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Abstract

Purpose – The purpose of this paper is to analyse the effect of training on *ad hoc* teams in an industrial setting.

Design/methodology/approach – In this paper, data were collected from 11 Spanish automobile manufacturer suppliers and included the assessment of the current situation, the creation and holding of different workshops followed by the collection of the results.

Findings – The paper finds that *ad hoc* teams are really effective especially in lean companies.

Originality/value – This paper breaks new ground in analysing the effect of training *ad hoc* teams in an industrial setting.

Keywords Spain, Training, Companies

Paper type Research paper

The main objective of this paper is to analyse the effect of training based on *ad hoc* teams in industrial companies implementing a lean production system. To achieve our goal, we collected data from 11 automobile manufacturer suppliers. The companies, located in Spain's major cities, belong to different industries (see Table I). They also manufacture a wide range of products including paneling, soundproofing, padding, metal mechanizing, metal pressing, welded components, nuts, plastics (injection and molded), mechanical assembly pieces, and electrical products.

The *ad hoc* teams or task forces are teams that do not form a permanent part of the organisational structure and are involved in a secondary task for their members (Bradford and Bradford, 1981; Lawler, 1996). This task is superimposed upon the habitual obligations of the group members within the company (Lawler *et al.*, 2001).

The main difference compared with other types of groups usually found in companies, such as quality circles or semi-autonomous groups (Glassop, 2002; Moses and Stahelski, 1999), is that the *ad hoc* teams are of very limited duration (sometimes less than a week). They are externally managed groups: they only have the responsibility of carrying out the task they have been assigned. Management designs the group task, selects the components, sets out the basic rules to achieve the objectives, decides the group training and supervises the group results (Hackman, 1990; Rees, 1997).

Depending on the company, data on how the *ad hoc* teams were working in the researched organisations, was obtained over a nine to 12 month period and was structured in the following way:

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	Processes	Turnover (million €)	No. employees	Sector
Case 1	Injection and assembly	28	200-300	Plastics
Case 2	Pressing, mechanizing, injection and welding	29	200-300	Metal-mechanical
Case 3	Pressing and welding	80	400-500	Metal-mechanical
Case 4	Mechanizing, pressing and injection	27	200-300	Metal-mechanical
Case 5	Injection	24	200-300	Plastics
Case 6	Mechanizing and assembly	60	600-700	Assembly
Case 7	Assembly	85	200-300	Assembly
Case 8	Injection and assembly	178	400-500	Chemistry
Case 9	Injection	125	900-1,000	Chemistry
Case 10	Injection and assembly	166	900-1,000	Plastics
Case 11	Injection and assembly	85	900-1,000	Electronical products

Table I.
Description of the companies studied

- Initial diagnosis of the company's situation and assessment: this generally took two days and involved working with a group of four to five managers from different departments. The aim of the diagnosis was to pinpoint the company's strengths and weaknesses and to gauge the main manufacturing indicators. We were obliged to trace the necessary data in each company, contrasting them with various sources, or recording them directly in-plant when discrepancies emerged.
- Development of training and intervention activities: a system of workshops lasting from four to five full days was used. The necessary theoretical concepts, adapted to each case, were presented and a detailed study of the production line was made. Groups of five to 14 people took part in these workshops, which included at least 50 percent of workers or team leaders. At the end of the week, the activities to be carried out over the following three months by the team members were put forward to management. Lastly, a date was set to carry out follow up on how the productive efficiency indicators had progressed. This process ought to be repeated three times until the objectives specified in the initial diagnosis were completed. The subjects to be taught were chosen according to the needs detected during diagnosis among the following (see Table II): measures implementation, group problem solving, waste elimination; 5s, visual factory; line balancing, standardized work; multi-skilled workforce, process layout (U-cells); quick changeover time (SMED); total productive maintenance; pull/push system (*kanban*).
- Closing session: the team provided management with a summary of the activities and the results achieved.

The information gathered indicates that manufacturing indicators had benefited from the *ad hoc* teams developed in the workshops. We will first, describe the initial companies' situation with regard to production indicators (Table III) and the improvement achieved after the workshops (Table IV).

Summarizing the main results obtained in the eleven cases studied, we should point out the following: a notable improvement was achieved in machine efficiency (approximately 18 percent) – this was basically due to radical improvements in

Table II.
Training interventions in the companies

Training interventions ↓	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11
1st	SMED	WE PL LB Kanban	SMED	SMED	SMED	GPS WE LB PL CPF	WE LB QPS Measu.	GPS WE LB PL CPF	SMED	GPS WE LB PL CPF	SMED
Date	June 1999	July 1999	March 1999	July 2000	June 2000	June 1999	July 2000	June 1999	January 2001	June 1999	May 2001
2nd	WE PL LB	VF Measu.	WE PL LB Kanban	VF QPS Measu.	VF QPS Measu.	Kanban	–	VF QPS	CPF	Kanban	TPM
Date	September 1999	September 1999	May 1999	October 2000	July 2000	October 1999		October 1999	April 2001	September 1999	July 2001
3rd	VF QPS Measu.	SMED	VF QPS Kanban Measu.	TPM	TPM	VF QPS Measu.	–	Kanban	TPM	VF QPS Measu.	–
Date	December 1999	November 1999	June 1999	December 2000	September 2000	January 2000		November 1999	July 2001	November 1999	

Notes: Codes: SMED = SMED; Total Productive Maintenance = TPM; Standardized Work = QPS; Line Balancing = LB; Group Problem Solving = GPS; Push/Pull Systems: Kanban = Kanban; 5'S,Visual Factory = VF; Process Layout = PL; Multi-skilled Workforce = CPF; Measures Implementation = Measu.; Waste Elimination = WE

Table III. Initial situation in the production indicators

Indicator ↓	Measure	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Mean
Quality (FTT)	(%)	91.2	82	78.3	93.2	97			76	55	71	90	81.5
Overall Equipment Efficiency (OEE)	(%)	53	67	66	59	70			61	77.2	79	60	65.8
Inventory	Days	6.9	13	8.2	23	14.5	9		17.8	10.6	39	37.6	19.2
Workforce Productivity	Units/WF hrs worked	6.4	19.6	69	4166	43.7	29.0	3.5	16.7		4.3	13	437.0
Batch Changeover Time	Minutes	18	35.5		357	89	40			75	17	180	101.0

Notes: FTT: this represents the percentage of components that complete a production process and meet quality specifications adequately without having to be rechecked, repaired off the production line, returned or thrown away as scrap; OEE: measures a machine's ability to perform an operation in accordance with quality standards, at the desired frequency and without stoppages; Inventory: an indicator of the mean time elapsed from the delivery of raw materials up to the shipment of finished products:

$$\text{Inventoryz; (days)} = \frac{\text{No. Pieces Inventory (units)}}{\text{Average Volume of Daily Production (day)}}$$

Workforce Productivity: measures the number of units produced per workforce hour worked; Changeover Time: total time a manufacturing process is stopped to perform a model changeover. It begins when the last correct component model is produced, and finishes when the first correct component of the following model is produced and the line is ready to manufacture the next product

Table IV.
Improvement in efficiency indicators

Indicator ↓	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Mean
Quality (FTT) (%)	8	5	11	6	1			1			5.6	5
Overall Equipment Efficiency (OEE) (%)	36	13	30	6	11			4			25	18
Inventory (%)		−41	−48	−22	−7	−64		−21			−60	−38
Workforce productivity (%)	11	14 +	17 +	8		34	60	23	9 +	21	14 +	26
Batch changeover time (%)	−33	−72	−75	−40	−71			−54	−48		−87	−60

Notes: The percentage of improvement was calculated as: (value at end−value at start)/value at start; +: Measured as direct workforce variation for a specific production instead of components' variation per worker changeover times (reductions close to 60 percent the original time); an almost 60 percent reduction in inventory levels and 26 percent increase in productivity. Besides, we measured an improvement of near 5 percent in the quality ratio. However, this doesn't mean that *ad hoc* teams have a low impact on quality indicators, since the starting point of the studied companies regarding quality was already high. In addition, we also observed considerable improvements in the use of space in the factory plant, a reduction in the number of containers, and in the distance covered by products.

Last, we should bear in mind that these measurements are not independent. An improvement in quality will affect the Overall Equipment Efficiency (OEE). OEE is also affected by a reduction in changeover time. As this decreases, more manufacturing time for a machine may be achieved. Nevertheless, this measurement is not direct. For example, if the company exploits the fact that the changeover is faster to make more model changes, the manufacturing time for the machine will not be higher; however, it is the inventory indicator that improves, since the work in progress is reduced because smaller batches are being processed.

An example of this can be seen in Company 4. The 6 percent improvement in OEE is due to the optimized quality of the products, while the 40 percent reduction in changeover times did not help to improve OEE, since the company's policy has been the reduction of batch sizes. This has improved inventory (22 percent) and allowed customers, on average, to be supplied with products a week earlier (going from 23 days to 18 days).

In conclusion, the results obtained in our research highlight how effective *ad hoc* teams are. We consider it is especially important to deal with the *ad hoc* teams in lean companies. The main reason is that the *ad hoc* teams include participative management style, training strategies, greater control process at the shop floor or more lines of communication, which, together with demonstration of the managers' visible commitment, allow resistance to change to be reduced (Lee, 1996; Power and Sohal, 2000). We are confident that this study provides evidence that will encourage other companies to implement similar processes that facilitate improvements in their working performance and efficiency.

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