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INNOVATION CASE

ATEX DO BRASIL – A NEW STRATEGIC NETWORK MODEL

By Hugo Ferreira Braga Tadeu

INTRODUCTION

Since the implementation of the Real Plan, the Brazilian economy has been the object of a series of governmental measures, such as the adoption of an exchange rate goal regime, the quest for inflation curbing and the reduction of public spending. In this economic environment, the world experienced several international crises such as those in Argentina, in Russia, in Mexico and, recently, in the United States, brought about by an unsound credit system and the absence of clear regulation.

However, the domestic growth observed in the past few years, notably in the Brazilian internal dynamics, is closely associated to several industries, among which civil construction.

Because of the housing deficit, never before in the history of this country so many real estate ventures were launched, from low value-added to luxury apartments. Several studies unveiled that the floor area square foot price in Brazil is second only to cities such as New York, London and Hong Kong, something unheard of ten years ago.

Following this rationale, several construction engineering machines and equipment providers felt the rebirth of an industry that nearly went bust at the beginning of the Real Plan. Investments in new machinery, technology, and inputs became necessary and urgent, as well as the development of specialized personnel to handle the demands of this market.

To meet the growing and constant demand from the civil construction market, ATEX do Brasil (ATEX) had to reinvent itself to grow and overcome its own production, management and competitive constraints. Since 1991, the company has contributed to the civil construction market with the pioneer introduction of striated slabs produced by injection molding, something new to the market. In the same manner, the establishment of new production units with greater production and inventory-holding capacity and under new industrial management has been pursued by the company, as seen in Figure 1.

Figure 1 – ATEX Unit and Stockpiling Capacity
Source: ATEX (2012)

In response to its pioneering effort, ATEX is a market leader and includes important jobs in its portfolio, such as the construction of Fundação Dom Cabral's Management Knowledge Development Center (CDCG), the expansion of Academia Mineira de Letras, the Santos Dumont Airport, in Rio de Janeiro. The Recife Airport, the Petrobras headquarters in Vitória, the Sauípe Complex, the Administrative City of Minas Gerais, the Olympic Village for the Pan-American Games, many shopping malls, large size universities, industrial companies, popular and high-level buildings. Figure 2 illustrates a job developed in the year 2011.

Figure 2 – ATEX job
Source: ATEX (2011)

Figure 3 shows a building construction process using the ATEX molds entailing scale, time and cost gains for the client.

Figure 3 – Construction Process using ATEX molds
Source: ATEX (2012)

One of the company pillars is product innovation, and ATEX today offers the largest number of striated slabs. Altogether, the company offers 52 striated slab molds in different sizes to meet the requirements from customers throughout the country. Figure 4 presents one such mold model, called ATEX 150. However, the company's production line success entailed a new challenge: exporting molds, with a skilled sales team to meet different market requirements.

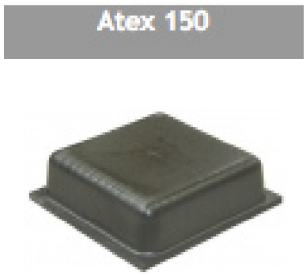

Figure 4 – Atex 150 mold
Source: ATEX (2012)

ATEX's central production unit is installed in Minas Gerais. The company also established production units in Rio de Janeiro, Minas Gerais and Pernambuco. Figure 5 shows ATEX's operations in Brazil. The white spots in the map are places where there is no demand for molds at this time.

Figure 5 – ATEX operations nationally
Source: ATEX (2012)

To meet demand growth in Brazil, and also serve clients with speed and quality, ATEX has to reinvent itself, seeking new organizational processes, a new work structure, a new production, inventory and distribution policy. Product innovation did not support market dynamics, and prompted the company to seek new management technologies to ensure its long-term strategy, that is, growth with substantial financial return.

Therefore, this case study's objective is to present the main problems experienced by ATEX with its national distribution model, with special attention given to the mold inventory volume, distances

covered and the decision for best industrial unit location. According to these analytical items, the company outlined improvement projects basing on a data survey conducted at the Minas Gerais headquarters, in order to contribute to the creation of management and control instruments to fully meet client demand, to support growth e obtain financial results.

For textual development, the next section presents ATEX's problems and their consequences. The problem-related work methodology adopted follows. Finally, conclusions are submitted, with the limitations imposed upon this effort and the results obtained. What follows is a literature review with the sources used in this case study.

PROBLEM

With the growth of the civil construction market in Brazil, new ventures of myriad sizes and segments sprout every day, under the pressure of a growing demand. By way of consequence, the suppliers to this segment need to reinvent themselves, innovating in product and processes to better serve their clients.

Having the best product is not enough. Understanding the company's strategic model is a must. For ATEX, checking on its national distribution became important, focusing on the volume of stockpiled molds, the distances covered and the decision for the best industrial unit location. It is estimated that the civil construction market will remain brisk in Brazil, at least until the Olympics. Therefore, what would be the best ATEX units and feasible routes? What would be the optimized distribution network structure? What is the perceived innovation?

METHODOLOGY

This section contains the description of the methodology used to solve ATEX's problems. The type of research method applied and the problems found along this effort will also be reported.

A quantitative study was conducted, adopting ex post technical analyses according to the findings unveiled. The methodology uses operations research techniques, that is, process optimization instruments, notably data survey at the company and the used of information expert systems and statistical analyses.

The data survey was conducted at ATEX's premises, according to the executive board's needs, through a new distribution model, using inventory balances per unit and the route distances in kilometers (the data used in the study are fictitious). The expert systems used were Excel and the Solver tool, recognized worldwide for its user friendliness and speed to respond. The statistical analyses became necessary for the assessment of new route cancellation possibilities or feasibility, taking into account Solver's sensitivity analyses, that is, the Confidence Interval and descriptive statistical models. The responses obtained via this model offered a gamut of inventory and route options, according to the data surveyed, and it became possible to produce a decision-making analysis.

Routing studies are related to decisions concerning new routes, as a function of the volumes moved, mileage, associated costs and demand, as long as there is correlation among the variables applied, seeking a cause and effect relationship among them. The decision concerning a new unit, route or possible cancellations will be made as a function of the results yielded by the Excel Solver add-in and by the experience of the ATEX team.

ANALYSES OF FINDINGS

The first step to analyze ATEX ideal routing was the data survey, containing the mold volume per unit, the distance between the company's units and clients. Figure 6 depicts the data survey per type of mold and units. Figure 7 refers to distance, as per a study done with Google Maps.

Product	ATEX MG	ATEX SP	ATEX DF	ATEX RS	ATEX PE	ATEX RJ	ATEX CE	ATEX AM	ATEX BA	ATEX ES
150 R										
1/2 150R										
600x225										
1/2 600x225										
600x325										
1/2 600x325										
600x425										
1/2 600x425										
800x200										
1/2 800x200										
800x250										
1/2 800x250										
800x300										
1/2 800x300										
800x350										
1/2 800x350										
800x400										
1/2 800x400										
900x225										
1/2 900x225										
900x325										
1/2 900x325										
900x425										
1/2 900x425										
610x160										
1/2 610x160										
610x180										
1/2 610X180										
610X210										
1/2 610x210										
610x260										
1/2 610x260										

Figure 6 – Molds per unit
Source: ATEX (2012)

Note that the data surveyed and presented in Figure 6 are hypothetical and refer to the mold models and destinations for each ATEX unit, seeking client rentals. The balances were removed, as per the company's information secrecy policy.

From	To	Distance
ATEX MG	MG	100KM
ATEX MG	SP	584KM
ATEX MG	DF	719KM
ATEX MG	RS	1867KM
ATEX MG	PE	1745KM
ATEX MG	RJ	479KM
ATEX MG	CE	2093KM
ATEX MG	AM	3932KM
ATEX MG	BA	1331KM
ATEX MG	ES	546KM
ATEX MG	MT	1635KM
ATEX MG	PI	2153KM
ATEX MG	SC	1316KM
ATEX MG	PR	1028KM
ATEX MG	AL	1772KM
ATEX MG	PB	2005KM
ATEX MG	RO	4714KM
ATEX MG	PA	2647KM
ATEX PE	MG	1745KM
ATEX PE	SP	2598KM
ATEX PE	DF	2115KM
ATEX PE	RS	3703KM
ATEX PE	PE	22KM
ATEX PE	RJ	2291KM
ATEX PE	CE	803KM
ATEX PE	AM	4487KM
ATEX PE	BA	794KM
ATEX PE	ES	1828KM
ATEX PE	MT	3123KM
ATEX PE	PI	1105KM
ATEX PE	SC	3294KM
ATEX PE	PR	2010KM
ATEX PE	AL	247KM

From	To	Distance
ATEX PE	PB	22KM
ATEX PE	RO	5269KM
ATEX PE	PA	3006KM

Figure 7 – Distance between units and clients in kilometers
Source: Google Maps (2012)

The data surveyed in Figure 7 were made available after using Google Maps, an information technology tool available in the Internet.

Following these stages, ATEX's work team met at Fundação Dom Cabral (FDC) to design the company's route map, according to Figure 8. The proposal of this case study is the analysis of the current company context as concerns mold costs and volumes, seeking to reposition client deliveries.

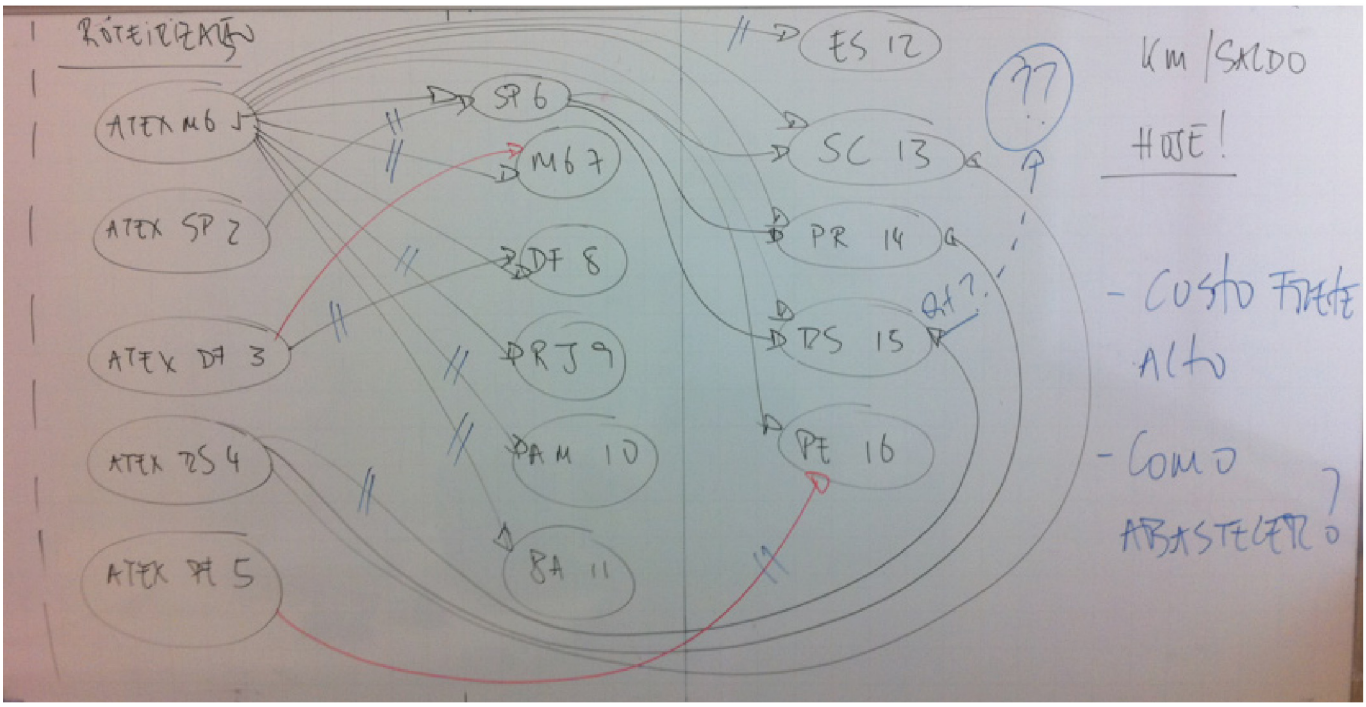

Figure 8 – Route map drawing
Source: Tadeu (2012)

Ensuing from the result of the Route Map above, the C-Maps system was used for the purpose of making Figure 8 electronically available.

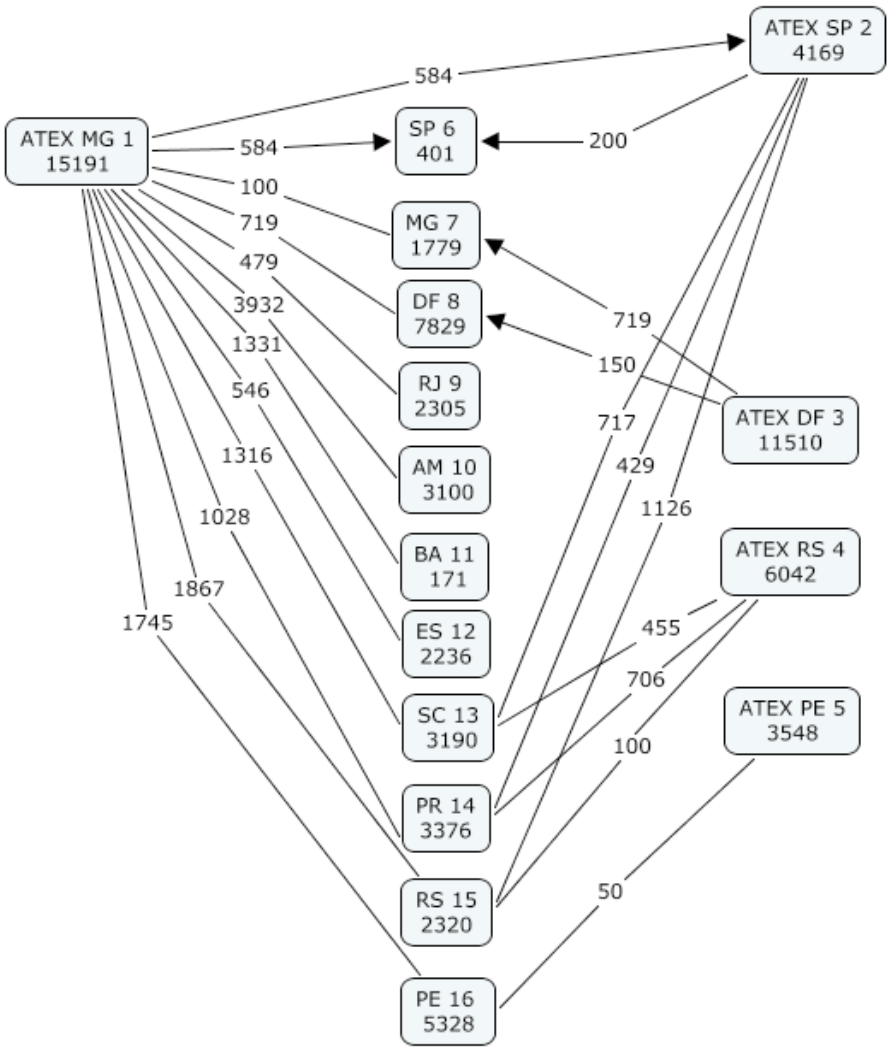

Figure 9 – Electronic Route Map
Source: Tadeu (2012)

From Figure 9, all the data were digitalized in electronic spreadsheets, and Excel's Solver system was used for the purpose of providing results to minimize transportation costs or maximize the company's capacity, as an opportunity to meet new market demands.

From	To	Km	Units
1	2	584	0
1	3	719	0
1	6	1.897	0
1	5	1.745	0
1	6	584	0
1	7	100	1.779
1	8	719	0
1	8	479	2.305
1	10	3.932	3.100
1	11	1.331	171
1	12	546	2.230
1	13	1.316	0
1	14	1.028	0
1	15	1.867	0
2	16	1.745	1.780
2	6	200	402
2	13	717	0
2	14	429	3.706
2	15	1.126	0
3	7	719	0
3	8	350	7.828
4	13	455	3.190
4	14	706	0
4	15	100	2.320
5	16	50	3.548

No.	Net Flow	Supply/Demand
1	11371	15.191
2	3777	6.169
3	7829	11.510
4	5510	6.042
5	3548	3.548
6	402	401
7	1779	1.779
8	7829	7.829
9	2305	2.305
10	3100	3.100
11	171	171
12	2236	2.236
13	3190	3.190
14	3376	3.376
15	2320	2.320
16	5323	5.328

Nº	legend
1	ATEX MG
2	ATEX SP 2
3	ATEX DF 3
4	ATEX RS 4
5	ATEX PE 5
6	SP 6
7	MG 7
8	DF 8
9	RJ 9
10	AM 10
11	BA 11
12	ES 12
13	SC 13
14	PR 14
15	RS 15
16	PE 16

Figure 10 – Excel's Solve System
Source: Tadeu (2012)

From the results seen in Figure 10, the following questions were raised:

- What are the ideal inventory volumes per ATEX unit?
- What routes should or should not exist?
- Was there a need to create a route-programming center?
- What were the training needs for employees working with mold inventories and routing?

- What are the market requirements that justify opening new ATEX units?
- What process innovation is needed to answer the previous questions?

After analyzing all the data and spreadsheets produced, the decision-making process was the adoption of an adequate routing plan, according to cost analyses as seen in Excel spreadsheets (Figure 10).

All company units should centralize information in Belo Horizonte, and the decisions concerning inventories and routes will be incumbent upon the new operations and routing unit. Besides the gains obtaining from the new management methodology, it was possible to note that process alignment among the other company units was not adequate and created countless operating problems. Innovation in process redesign can be noted and yields strategic, operating and financial gains to ATEX.

CONCLUSIONS

According to the country's economic growth in the past few years, the civil construction industry may expect growing demand. Such market response encouraged new ventures throughout the Brazilian territory, as well as the alignment of suppliers.

Within this context, ATEX needed to reinvent itself to grow, overcome its own production, management and competitive constraints. The routing and client delivery problem entailed heavy costs, encouraging the quest for a new operating mode. New management methodologies became necessary, assessing current routes, inventory levels and the feasibility of the current structure.

Data survey was a substantial problem and represented a constraint in the study, as a function of the absence of expert systems and the urgency to meet clients' needs, which created constant errors in the delivery of the requested reports.

Process improvements can be noted from the financial gains exacted by the company, and the effort can be configured as an organizational innovation process that justified the development of this study.

REFERENCE

Visit to ATEX do Brasil's plant in Lagoa Santa, in November, December, February, March and April 2012, guided by:

- Pedro Penna, Executive Director.
- Silvério Gomes, Operating Manager.
- Flávia Dias, Comptroller.

Consultations with site http://www.atexdobrasil.com.br, in April 2012.

Interview with Mr. Pedro Penna, Executive Director, on 3/5/2012.

Interviews with managers Silvério Gomes and Isaias Silva, on 4/11/2012.

Professor Hugo Ferreira Braga Tadeu participated throughout the operations improvement and organizational innovation process. The following IT systems were used:

- Cmaps Tools – map creation.
- Google Maps – survey of geographic data.
- Excel's Solver – data simulation and managerial problems.