

## New Expectancy of Administration in Multinational Manufacturing Plants and Necessary Changes in Academic Plans in I.T.R. (Instituto Tecnológico de Reynosa)

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**INTRODUCTION.** - The multinational industrial plants in the Mexican border with USA, started operations three decades ago in a rudimentary manufacturing process, with poor technologies and wide utilization of non qualified hand workers. These plants applied elementary administrative systems planned in headquarters. Today they have made substantial changes and obligating corporations to modify basic strategies in order to integrate new necessary operations according to present reality. The most important reforms as multinational enterprises are about great mobility of capital, obtain high and quick return rates of the inversion, and more financial ranks in an explosive extension of the markets, trying to obtain more valuable goals at an international level. They had some modifications in their organizational corps for high system innovations and very important functional specialization job design at an international scale. All of them were supported by transcendent-spatial technologies that optimized transportation of raw materials and finished products all over the world, trying to cover the biggest markets. These structures are developing in a wide net of satellite communications; digital or computerized in order to optimize their functions. This phenomena was described by Paul Hirst, 1996, in a market globalization context and explain why at the end of 80's, multinational corporations operated in industrial plants at their own original countries. Their products were selling in near areas at a limited regional expansion. In other words, Europe was supplied by the United Kingdom and Germany, and their products did not have distribution in Minor Asia. Japan worked in the same way in the Asiatic Pacific, at the same time USA and Canada had their markets in Latin America. When the 90's began the massive market globalization and the necessary operation of the multinational plants in different countries of the world. The USA in 1993 modified its manufactured function, disseminating in various geographical areas of the world. The same situation happened with Japan, Germany and the United Kingdom.

The evolution mentioned circumstances in the above, is in a critical level for the year 2000, because today it is necessary to apply new and more sophisticated systems of production and administration, in order to give more agility at the diffusion process of the hard technologies and software of new and important industrial branches. In addition give more mobility at work markets and reaches the faster worker training at the most advanced rhythm, according to technological development of manufacturers. This enunciated involves important costs for some multinational enterprises to improve the development of industrial cultural systems in some geographical regions of the world, because they need to apply vanguard technologies in new societies, in contrast with other plants that only want to extract the maximum of the total

usefulness, without the act of investment in the integral training of the qualified worker. The principal idea of the last corporations is to obtain an instantaneous recuperation of investment of the technological development. The author that best exposes these concepts is Kelvin Cox, 1997, because he says that not only the evolution of manufacturing systems imply the automatic contemporary progress, but also it is necessary that the most genuine integrated of the impulses which the industrial plants obtain higher levels of technologies, performance and administration.

The real economic globalization guides the multinational enterprises at the best organization of their plants, not at all as a change process in a political environment or the social structure where they are installed, but as in the deeper knowledge of the work stations, where the workers are trying to be more productive everyday. Getting with that a new dimension of job concepts, borders and territoriality.

At the northeast of the Mexican Republic, Asomoza and Acosta, 1998; observed that multinational plants were moving in two directions. One way is through traditional forms, transferring and implementing some models of labor exercise that had been programmed in headquarters in their original countries. These designs had the minimum adequate at Mexican labor systems. The other direction is to permit substantial changes in their manufacturing plants including qualify workers and professionals in engineering and business areas, learning of new technologies, in order to make the pertinent adaptations at work systems in similarity with other recommendations authors, like Hammer Michael, 1993, about reengineering; Angus B. Robert, 1997, when he explain concurrent engineering in systemic and integrated approach; Zaremba Marek, 1994, specifying the logistics systems under monitoring control; Uhl-Bien Mary, 1998, that worked on labor autonomy with monitoring groups in a high grade of responsibility. The expressed for these authors has been fundamental for successful changes in industrial plants of the Reynosa sector of Mexican Republic. The evaluation of obtained results with the implementation of this original systems in Mexican multinational plants originated that the headquarters of the plants decided adopt same changes in similar manufacturing plants in other countries, under the direction of Mexican engineers and professionals of the administration. The application of these kinds of models is increasing, and one explanation for this, will be expound in conclusions of this research.

Industrial plants with traditional administration have severe technological and labor problems of difficult solutions. These problems originate some manufacturing plants state at academic authorities of ITR, the necessary reorientation of administration career in order to obtain a graduate with more knowledge about integral resources administration in its new fields of expansion, in spite of today graduated who are specialized in human resources, this last was as a petition of manufacturing plants of Reynosa three years ago. The explained situation let us outline this research, trying to obtain a better knowledge of the conceptual frame, in which is moving the administrative process and the professional of administration in industrial plants giving as a result of it corrective dispositions in order to avoid mistakes as them mentioned by Robert French, 1996, about disarticulation among administrative practices and the process of education in university studies and a fail in unity of conventional administration and administrative research. This problem obeys to joint in concerting way the different branches of administrative knowledge.

DEVELOPMENT. - The stated problematic situation and the theoretic frame of reference that will be found briefly at conclusions, moreover of sustaining interviews with academics of ITR; managers and administration chiefs of the manufacturing plants, at the biggest multinationals of the world, located in Reynosa, Tamps, Mex; permitted us to state the following hypothesis:

I. - Dimensionally of the exerted administration by administration chiefs of manufacturing plants, is different of which study plans and programs of administration career of ITR includes.

II. - The different knowledge levels of administration that industrial plants are using; give the opportunity of hiring a variety of professionals from different areas.

III. - Different profiles of professionals and multiple levels of knowledge of administration chiefs in manufacturing plants create important and strong conflicts in the development, coordination and communication of technical and administrative projects in the global administration of the plant.

IV. - The administrators with higher ethical values in professional exercise exert a greater control of integral administrative process in industrial plants.

V. - Sex of administrators determines differences in project development and the administrative coordination that is exerted in manufacturing plants.

In order to demonstrate these hypothesis and variables of this research, we have dimensionalized the administrative knowledge in the field of superior education and the inner of daily practice at manufacturing plants of Reynosa, Tamps, Mex. With the dimensionality, we obtained a perceptual instrument, which was applied, to 58 % of administrative chiefs of the most important manufacturing plants of Reynosa Tamps, Mex.

RESULTS. - The obtained data of empiric test of thirty questionnaire respondents was treated with inferential statistics. The factor analysis demonstrated three important factors, as we can observe in figure number one. The first orthogonal factor was denominated “conflict in administration and a project development”. The second factor represents “conflict for innovation, labor performance and the profession of the administration chief”. The third factor typifies “Ethics and administrative socialization”. The same figure has the factorial coefficients, eigenvalues, Kaiser-Meyer-Olkin test and the significance level, that confirm us the utility of this data as Phenix Philip, 1958, affirmed saying that only in the meaning of the concept we know that knowledge can be validated through specific procedures and that the knowledge can not be validated unless the meaning is definite. The variables and concept-dimension that we observe in figure number two are very good examples of the last affirmations. The reliability analysis attained standardized item alpha of 0.62, and probability and significance level of 0.001 that give us the important value of this test. The multidimensional scaling gave 0.05 of stress for matrix and squared correlation (RSQ) of 0.99. We could obtain three specific dimensions in an Euclidean model of distances, where the conflict in labor performance had an important roll into

the worst problems of manufacturing plants. This severe condition has high levels, up to administrative conflict and organizational conflict.

Discriminant analysis for variable “organizational conflict” show us two discriminant functions with lambda of Wilks’ of 0.10; chi-square of 56.44 and significance level of 0.001; canonical correlation of 0.88. This discriminant function was integrated for administrative coordination, technical project development and perfecting of manufacturing systems and financial programs. The 77 % of the cases had been correctly classified. The second discriminant function represent the variable “communication in organization”, it had lambda of Wilks’ of 0.48; chi-square of 18.43 and significance level of 0.001; canonical correlation of 0.72.

The variable “assignation of administrative functions” was practiced discriminant analysis and gave one useful function for variable “administrative coordination”, with lambda of Wilks’ of 0.16; chi-square of 43.28; significance level of 0.001; canonical correlation of 0.88. The 47 % of the cases had been correctly classified. The variable administrative ethic in discriminant analysis show us one useful function for variable “administrative control”, with lambda of Wilks’ of 0.48; chi-square of 18.09; significance level of 0.05; canonical correlation of 0.68. The 64 % of the cases had been correctly classified. The variable “severe labor performance conflicts” show us useful discriminant function for variables technologic innovation and technologic projects development with lambda of Wilks’ of 0.31; chi-square of 28.50; significance level of 0.01; canonical correlation of 0.77. The 67 % of the cases had been correctly classified. The Box’s M test was 21.82 with significance level of 0.004. The variable sex of the administrative chiefs in manufacturing plants had one useful function for the variable “integral administration performance, technologic innovation an administrative control”, with lambda of Wilks’ of 0.64; chi-square of 11.22; significance level of 0.04. Box’s M of 49.31 and significance level of 0.0005.

**CONCLUSIONS.** - After verifying statistical data, we found a deep conflict trouble within the manufacturing plants in Reynosa Tamp. Mex. Consequently, in first place, because of the inoperative behavior of the management in order to developing technical and administrative projects, in order to increase the productivity yields in general at the plants. In addition, the lack of managerial coordination functions and the integral communication between departments and services of the plants. On the other hand, deeper studies were held about these same variables, and we found in the same way strong association with the above mentioned variables with those representatives of management control, improving technical systems, enterprise financing and also with the technical and administrative investigation. With a deep interest, in order to observe the vectorial force of these variables, we found a most extensive association with an eigenvalue of 7.88 for the first factor under study and it represents 51.3 % of the total conflicts at the integral exercise in manufacturing plants. By the contrary the deeply of the managerial conflicts the variables of first factor were found with strong correlations with variables of professional development of the administrative chiefs and their ethic performance; these group of variables gave values of Kaiser-Meyer-Olkin higher than 0.74 and the significance level was 0.0001.

The first hypothesis established in this paper is accepted because it was verified that manufacturing plants need a very wide level of knowledge for all the administrative processes in

order to achieve objectives, and of course, these are not only focused into the handle of the management of human resources, like the majority of the “maquila” plants were soliciting this since the beginning.

The second hypothesis was rejected because the results show us that the management exercise of industrial plants in this region need expertise management people in administrative processes, in special management of planning, organization and administrative manufacturing operations and also in the general control of all processes, with an integrating focus and close bond with high technological development experienced by this industrial zone.

The third hypothesis is accepted and was perfectly showed with results found in this research, that the most conflicts found in industrial plants are originated because the lack of capacity of administrative chiefs for developing technological projects linked in a close relationship with labor performance, with the idea of reaching the technological articulated innovation. About this particular issue the discriminant analysis, in its canonical correlation reported a coefficient of 0.77 and about 67 % of the analyzed cases had been correctly classified, other than the Box’s M test had significance level of 0.004. The antecedent variable for the last case is represented in the professional multiple profile of the administrative chief, according with what we explained in the lines above, the most profound of the conflict was handled and its strong association with the professional and ethic development of the administrative chiefs.

The fourth hypothesis is accepted through the discriminant analysis in what the 64 % of the cases had been correctly classified; it means that two thirds of the analyzed cases under study were showing an association between the ethic and the control of the management.

The fifth hypothesis is accepted and was verified that the sex of the administrative chiefs is a very important factor for the integral and efficient exercise of the management. The interaction between the variables associated with the sex, and in a very special way the discriminant analysis and the Box’s M test, confirms this.

The results obtained from the investigation let us make some reflections about the circumstances in what the phenomena studied were found. In first place was accepted the fact that exists a profound gap between the study plans in the Business Management Career of ITR and the necessities about integral management found in the manufacturing plants. This situation is significantly bad because it is not recommendable brake the ties between the teaching-learning process of the social economic and industrial conditions of the surrounding environment, Orlich Donald, 1994, found the necessity of interaction between, the student, the teacher and the integral resource of the environment. Only in this way we will be able to know where to focusing our goals, and what changes we need to do, or what kind of solutions can be given to the specific problems. This true statement is clear when established structures through the investigations. The information that we give has the final reason of showing problems, with their most factible solutions. Also knowing that decisions are taken in other levels and any single “directive” or mid-management person could be finger pointed like “a man without head and heart” like Loader David, 1997, said; however, the circumstances and stress that the social surrounding put over the above-mentioned “directives” in order to achieve their decisions. The most significant goal to reaching this work is basically finding ways to reach the goals in superior levels of similarity and veracity between the educational system and the manufacturing process, maybe with an idea of

philosophic thoughts of Spinoza, that the ideas were transformed by him into paradigms according to Waissman David, 1996, this of course, without forgetting the union that the school and factory will face in the twenty-first century.

The most remarkable issue about this investigation is the fact that management in manufacturing plants has a very critic situation because of labor conflict, the conflict at organizational level and ethics problems of administrative chiefs. The philosophy of the science has been making enough efforts to let us know that we are in the middle of a conflict; by this reason Bolman Lee, 1994, comments that we need to learn more about the conflict and why it is so difficult for people to try with it. According with our opinion is not remarkable to foment the conflict because of negligence, apathy or ignorance. In reference to the ethic problems it is essential to specify limits and give more attention at the administrative function, trying to be most translucent to the eyes of working people and society. Knowing that we are placed in the threshold or the joint of among the ontogenic authenticity of the moral and the most consternate side of the deep moral and the fact that this moral has been contingent also has showed a high degree of persistence, Blacker David, 1997.

The handling way of all these ideas within their deepest projection only pretend reaching high productivity level and avoiding what Lorange Peter, 1994, says about inefficiency of strategic planning and also mentions the case of a very important multinational corporation in electronic business. Where production costs were four times higher than the production costs of the best world manufacturer in the same business, and the quality of its products were 80 % below the quality levels of the top corporations; moreover the manufacturing timing was twice higher, all of these because the plants had no efficiency in its process activities and between personnel.

Pretending to conclude this paper we want to underline the basic concepts of the following authors, that have a deep aware of the industrial moment that the world is living, but in a remarkable way they do not loose the perception about the promissory future that technology and science will be developing to the manufacturing process, these author are Zaremba Marek, 1994; Rembold U., 1993; Render Barry, 1997; Biekert Russell, 1998; Dorf Richard, 1994. The essential summary of this investigation is found in some concepts of the last author who express that the real interaction between management and manufacturing is found only through that improvement of the project to optimize the goals in order to achieve the potential usage of resources that the enterprise has. The management and technical planning in a project determines the nature of the path to follow, in order to achieve responsibilities. This in the same way upgrades the resources network, activities, processes, plans and more useful objectives. Now we can say that technology and manufacturing are most tied in order to achieve the strategies for reaching success in industrial plants. In this working plan the project of paths of labor give a real time frame to reach the logical utilization of time, and also influences the limitation of resources, even under severe restriction plan and after re-planning the integral activities of manufacturing, where cooperation and coordination for labor are fundamentals, and help us significantly in possible solutions of conflicts.

## RECOMENDATIONS:

- Continue with research studies between education and manufacturing processes.
- To insist that professors of business administration career give the necessary level of importance to the systems of teaching -learning in manufacturing areas.
- To motivate the students of business management careers, in order to expand the professional field, taking a significant model the most important innovations.
- To motivate the administrative chiefs of manufacturing plants, in order to realize courses of post-grade and motivate them to be updated into the universal concept of the new management.
- The ITR needs to re-value the structure of business management career in order to prepare its graduated students according with the reality world.
- Recommend to manufacturing plants that activities of management need to be realized  
by professionals with this profile.

SUMMARY. - It was realizing an investigation about the dimension of administration in administrative chiefs of manufacturing plants in Reynosa, Tamps, Mex; and these were under comparison with the dimensions of the business management in ITR. The research was held in a zone with great industrial grow in the northeast of the Mexican Republic. An instrument was elaborated specifically for the group under study, which was performed to thirty administrative chiefs of manufacturing plants of international enterprises in Reynosa Tamps. Mex. It were shown as the 'concept-dimension' most important of the administration in the technologic manufacturing area, and the superior-educational system. Also was described as theoretic corps that covers both systems and share new knowledge, today and in the future. The statistical results have been presented through inferential statistics of factor analysis, reliability, multidimensional scaling and discriminant analysis. The discussion about results was held and some important conclusions were obtained. The more important recommendations were considered and the bibliography was consigned.

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T A B L E            N U M B E R    1

ADMINISTRATIVE CHIEFS OF MANUFACTURING PLANTS

Factor Analysis Results.

SCALE :    Dimensions of management in the Conflict and Ethics  
for the labor and professional performance in  
manufacturing plants.

n = 30

VARIABLE	F A C T O R S			COM	AVERAGE	D.S.
	I	II	III			
18	.91	.11		.86	4.06	1.04
05	.91			.83	4.10	1.15
07	.87	-.14		.77	4.03	.92
10	.78			.61	3.56	1.19
22	.37	.75		.70	3.83	1.20
28	-.18	.70		.54	2.20	1.62
23	.34	-.53		.57	2.80	1.18
24		-.26	.89	.86	4.56	.81
25		.35	.67	.59	4.56	.81

Continue Table Number 1.

FACTOR	EIGENVALUE	PCT	PCT Acum.
I	3.33	37.0	37.0
II	1.71	19.0	56.0
III	1.29	14.4	70.4

Kaiser-Meyer-Olkin M.S.A. = 0.62

Bartlett Test of Sphericity = 107.5

Significance level = 0.000 1

T A B L E N U M B E R 2

ADMINISTRATIVE CHIEFS OF MANUFACTURING PLANTS

Variables, Concept-dimension and Factors of Conflict and the Ethics in the Labor and Professional Performance in Management of Manufacturing Plants.

VARIABLE	CONCEPT-DIMENTION
FACTOR I	CONFLICT BETWEEN MANAGEMENT AND DEVELOPMENT OF PROJECTS.
18	Organizational Conflict.
05	Management Coordination.
07	Organizational Communication
10	Development of Technical-administrative Projects.
FACTOR II	CONFLICT FOR INNOVATION, THE LABORAL PERFORMANCE AND PROFILE OF THE ADMINISTRATIVE CHIEF.
22	Innovation.
28	Administrative Chief Profession.
23	Conflict in the Labor Performance.
FACTOR III	ETHICS AND SOCIALIZATION IN MANAGEMENT.
24	Ethics in the Management.
25	Administrative Socialization.