MANAGEMENT AND DEVELOPMENT OF A WORK FORCE: THE CHALLENGE OF SUSTAINABILITY

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ABSTRACT

This paper looks at an Small Medium.size Enterprise (SME) in Mexico, a maquiladora site whose work force possesses most of the typical characteristics noted in them. The plant in the study is an assembly plant for medical devices; thus, the incentive to achieve a high level of quality in the output is intense. Yet, the plant's work force has an annual turnover rate that is over one hundred percent, and works under all the burdens (marital, education, gender). Under these conditions, attempting to sustain a successful company to aid in the building of an economy is a difficult task. Based on an intensive study of the workers and their personal attributes, this paper looks at the issues, both visible and hidden, in the management and development of such a work force, discusses the impact on the operation of the company, and makes suggestions for improvement of the workers' lot; thus, the company; thus, the country's economy.

KEY WORDS: Job turnover, Ensenada, Mexico, *Model of Employee Turnover, maquiladora industry (foreign assembly plant industry outside the U.S.A.).*

RESUMEN

Este artículo centra su estudio en una empresa PyME (Pequeña y Mediana Empresa) en México, una maquiladora cuya fuerza laboral posee las típicas características que las caracterizan. La planta en estudio, es una empresa ensambladora de artículos médicos; luego entonces, el incentivo para lograr un alto nivel de calidad en la producción es intenso. Sin embargo, la fuerza laboral de la planta manifiesta un alto índice de rotación, el cuál es casi del cien por ciento anual a consecuencia de las cargas (maritales, educacionales, de género). Bajo estas condiciones, el intento por mantener a una compañía exitosa que sustente la economía es una cuestión realmente complicada. Basado en un intensivo estudio aplicado a los trabajadores y sus atributos personales, este artículo muestra los asuntos visibles y ocultos en el manejo y desarrollo de cómo una fuerza laboral se debate el impacto en laoperación de la compañía, haciendo sugerencias de mejora en el lote de empleados, así como en la compañía, y, en la economía nacional.

PALABRAS CLAVE: Rotación laboral, Ensenada, México, Modelo de Rotación de personal, industria maquiladora (planta extranjera de ensamblaje fuera de los Estados Unidos de América).

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Introduction

The material to follow looks at the relationship between direct turnover of the company ICU Medical of Mexico located in Ensenada, Baja California (hereafter ICU Medical), and the socio-demographic profile of the worker, worker job satisfaction, and perceived type of leadership as exercised by the supervisors.

ICU Medical is dedicated to assembly of medical products for the administration of intravenous fluids, with a total of two hundred and twenty direct labor workers. At the time of the study, the company had an average monthly turnover rate of 13%, which indicates that if the company wants to maintain its level of workforce; thus, its production, it is faced with the need for ongoing replacement of one and one-half times its total workforce each year.

The need for continual recruiting due to constant resignations (or non-appearance) by staff represents issues important to the company and its performance. The phenomenon of constant staff rotation inhibits the current efficiency of the organization, in addition to putting its future in danger. At the current turnover rate (13 percent per month), the additional costs of recruiting, selection, induction, training and resignations are formidable. A turnover rate of 13 percent per month means ICU Medical must provide enough staff personnel to add over 340 employees per year to sustain its 220 person work force. Over and above the direct costs associated with the turnover, it affects ICU Medical in many other ways. Chief among these are (1) the near impossibility of maintaining a well-trained work force able to continually generate the quality level expected of medical products, and (2) the continual and gradual negative impact of constant turnover gives the company a reputation as perhaps not the best company for which to work. With the turnover, the spectre of production quality issues and quality of life reputation combine to affect productivity and efficiency of the productive area of the company very significantly. For areas with a large number of maquiladora enterprises, a dynamic labor force, and thus an easy task of finding other employment, it is unlikely the turnover problem will go away on its own.

Each time a direct employee decides to leave the company, there is an open position which the company must pay to fill as soon as possible by another new entry worker. Even when filled, the new hire does not have the skills and training needed to meet the expectations of the post which was left vacant, often requiring a period of adaptation and training of thirty days or more. This is particularly important in the medical devices field, where the consequences of bad quality often have high stakes.

According to Hope and Hill when employees are separated from the company, the maquiladora incurs costs for at least two reasons. These are associated with overtime for the employees who remain due to the need to maintain production with fewer employees, and the costs of training new employees. Since a lower production cost is a major factor in the development and survival of the maquiladoras, it is critical to determine the internal and external factors linked to employee turnover. (Hope et al, 1997). This study investigated both sets of factors.

Previous Pertinent Research

Interesting and appropriate research has been done on the maquiladora work force prior to this study. In 1993, Carrillo and Santibanez did a major study of employment and change of employment in the border maquiladoras, and were looking for the reasons for the workers leaving their jobs. They believed among the many reasons was the low wages and low benefits, or because their work was boring or too tiring. This was exacerbated by the fact there was higher demand for labor than there was labor available. Carillo and Santibanez suggested the turnover could be ameliorated by aiding with decent housing, taking the workers' needs into account in the company's decisions, and by creating a friendly atmosphere and chances for advancement within the maquiladora industry.

Two years prior to the Carrillo and Santibanez study, Harley and Zenteno noted in Tijuana there were comprehensive employment opportunities and a competition among firms to attract labor, thus contributing to a large economic dynamism. They stated one of the most serious problems afflicting the maquiladora industry in the border towns from Cuidad Juarez to Tijuana was the large turnover of the work force. Carrillo, et al, 1993, noted the average turnover for the city of Tijuana, in the three sectors of electronics, auto parts, and clothing, averaged 12.7 percent per month in 1989, calculated to over 150 percent per year.

The Carrillo, et al, study found that females made up over sixty-five percent of the work force in Tijuana's maquiladora industry, and approximately sixty-eight percent of the workforce was unmarried. It was noted the preponderance of unmarried workers had not changed in studies from 1976 through 1993. For forty percent of the workers, it was their first job. They offered the further demographic information that sixty-five percent of the workers did not have children and of those who did, the average number of children was 1.2. Thus, as of 1993, three predominant characteristics of workers in the maquiladoras was young, unmarried, and without children. Carrillo, et al, also found the interesting statistic that less than twenty-three percent of the workers in Tijuana were natives of Tijuana.

Previous studies expected the maquiladora workers to have a second income through a second job, since the industry wages were low. This was not found to be the case, with only 3.3 percent holding a second job. Those who added to their income generally did it through additional work. (Pena, 2000; Arrioja, 1993).

Other authors have researched on the maquiladora Industry (Barajas et al., 1989, English et al, 1989, Kras, 1989, Levy et al, 1983, Lucker, 1987, Miller, 2001, Mungaray, 1990, Quintero, 1997, Sarget et al, 1998, Teagarden et al, 1991) finding new models, theories and information that prove that the maquiladora industry has to be analyzed in a systematic point of view that help the organizations in the border to administrate and control turnover.

As will be seen in the demographics of the ICU Medical survey, some of these conditions that held for 5 years are still true, while some of them are seen as changed or changing.

Methods:

The overall objective of the study was to answer three questions. These were :

(1) To what extent is the employees' decision to continue working for the company influenced by the degree of job satisfaction?
(2) How does the kind of leadership exercised by the supervisors affect the turnover rate at ICU Medical?
(3) What socio-demographic characteristics exhibited by the direct employees contributed to their tendency to remain with ICU Medical and build seniority?

The scope of this study is correlational, since we wish to investigate the independent variables' influence on the dependent variable. As will be detailed later, the methods used for the collection and analysis of data are largely quantitative, consisting of questionnaires and correlation analysis, respectively (Edwards et al, 1998). In our case, the dependent variable is employee turnover, in all aspects. This includes employees who voluntarily leave ICU Medical to go to another job or to other non-economic activities, as well as employees who are separated at the company's behest. In either sense, their talents are lost to ICU Medical, there are time lags before new personnel can be found/attracted and hired, and the new hires are subject to a learning curve of company and industry policies and production practices. Each of these factors has financial consequences.

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The independent variables used in this research are as follows. (1) Profile: this encompasses the whole socio-demographic profile of individual characteristics such as age, gender, marital status, education, and number of children, among other personnel-related issues. (2) Perceived job satisfaction: this refers to the degree of job satisfaction felt by the employee as

a result of his or her direct contact with the working environment. (3) Leadership: The variable leadership is defined for the study as the pattern or characteristic of how the supervisor influences the subordinate to work toward achieving the targets set by the organization.

The study was conducted via a questionnaire utilizing Likert-type scales. It consisted of twenty questions, with the first five of those gathering the demographic information of age, education level, marital status, number of children, and longevity on the job. The remaining questions were categorized into one or more of the job attributes being investigated; e.g., opportunities for promotion, perceived fairness of justice on the job, how the worker like her job, her supervisor, her coworkers, etc.

In making up the study questionnaire, the work of March, J. & Simon, H. (1958), and the models of Martin, T. (2001), and Bluedorn, A. (were used. The results of this investigation into turnover at ICU Medical are based on questionnaires and Likert scale responses to questions gathering worker demographics, and worker perceptions concerning management. Accordingly, the outcome of the investigation yielded results that are descriptive in nature, rather than prescriptive.

Results:

The basic demographic information for the workers is as follows.

Worker Age.

The worker age responses were divided into five-year increments, with responses from zero to five. A response of 1 indicated an age of 18 – 23 and a response of 5 indicated an age of 40 or more. A response of 0 meant no response or a preference not to answer. For the ICU Medical staff, the mean was 2.46, and the largest number of responses indicated an age of 18 – 23. As the numbered response increased (i.e., as age increased), the number of responses in that range dropped off in essentially a downward slanted straight line. Only twenty respondents out of 170 indicated an age of 40 or more. Thus, the production staff at ICU Medical is young, and the company appears to have a preference for workers in the 18 to 39 year age range.

Martial Status.

Marital status information ranged from 0 = No Answer to 1 = Single, 2 = Married, 3 = A significant other, but not married, 4 = divorced, and 5 = separated.

By far, the largest number of respondents were married, with the categories of single, or with a significant other, but not married, being about equal in number and next in numbers of responses. Almost none were divorced

Schooling.

Data on schooling of the ICU Medical staff was taken according to the Mexican system of primary, secondary, and preparatory schooling, with two categories for each; i.e., Incomplete or Completed for each category, plus one for No Answer. The mode was completion of secondary school, with responses for incomplete secondary, incomplete preparatory, and completed preparatory following fairly closely. The mean was 3.6, which was between incomplete secondary and completed secondary.

Number of Children.

The categories for number of children ranged from zero to seven or more, with 1 = zero children, 2 = 1 – 2, 3 = 3 – 4, 4 = 5 – 6, and 5 = 7 or more. Almost half of the 170 respondents fell into the 1 – 2 children range. Approximately twenty percent of the respondents reported no children.

Time Working at ICU Medical.

Responses for the longevity of employees was categorized into 1 = 1 to 6 months, 2 = 7 months to 1 year, 3 = 1 to 2 years, 4 = 2 to 4 years, and 5 = over 4 years, with the usual 0 provision for No Answer. Approximately half of the 170 respondents reported their time working at ICU Medical at one to six months. Well under five percent reported service of four or more years.

Pearson's Correlations.

Table 1 shows the Pearson's correlations between the independent variables of perceived labor satisfaction and perceived leadership exert with the dependent variable of turnover.

Table 1. Pearson´s correlations

		Satisfaction	Leadership	Turnover
Satisfaction	Pearson correlation	1.000	.575**	.510*
	Sig. (2 Tailed)	-	.000	.000
	N	170	170	170
Leadership	Pearson correlation	.575**	1.000	.600**
	Sig. (2 Tailed)	.000	-	.000
	N	170	170	170
Turnover	Pearson correlation	.510**	.600**	1.000
	Sig. (2 Tailed)	.000	.000	-
	N	170	170	170

** Correlation is significant at the 0.01 level (2-tailed).

As shown on table 1, both independent variables have significant pearson's correlations with turnover, being their values above 0.5, which indicates a high correlation.

Commentary on the Results

The study discussed here was based on the survey of 170 female staff workers at ICU Medical. Although Likert-based; thus, in a form fairly efficient for the time of the workers, the survey was extensive. In addition, the statistical analyses were even more extensive. Due to space limitations, the details and the statistical tables have been omitted from this paper. Additional detailed information on the survey and its statistical results may be obtained from the senior author.

As with much other research, this study raised as many questions as it answered. This limited study did not consider, for instance, such issues as wages, benefits, training, communication, promotion opportunity, geographical location, product type and accompanying procedures (see "clean room" discussion below), the external environment, and competition for labor. Each of these, individually, and all of these in concert, may well have a large effect on the labor force of ICU Medical. As can be seen, the phenomenon of turnover offers a multitude of issues for investigation.

As noted previously, the entire staff labor force at ICU Medical is female. Thus, gender and culture, in its own way, may have an impact on the work force turnover. The work environment of the study, due to policies and procedures related to the medical products, can be considered to be strict and unconventional. The production area requires an aseptic or "clean room" environment akin to an operating room. For the worker, this translates to mesh-covered hair, shoe covers, no makeup, no jewelry, no acrylic nails and natural nails trimmed and clean, no clothing leaving skin exposed to the environment, et al. Unless there are advantages offered by ICU Medical that are not offered by competitors for the same workers, the restrictions on mode of dress and personal hygiene may cause enough disapproval by the worker that she looks elsewhere for employment.

The data were gathered by methods designed to economize on the workers' time. Thus, responses were within predefined ranges, and had no place for responses that either did not fit any of the categories, or needed narrative explanation. It would be of interest to see the results of a more comprehensive investigation of worker feelings and attitudes, with the results based on individual and possibly open-ended answers for all 170 respondents.

The result of having range-based input, and reporting means and standard deviations of responses has a tendency to disguise some results. For instance, if a majority of workers liked the supervision and checked the "good" side of the Likert scale, but a large minority checked the "bad" side, the mean will compute as OK, in general. Yet, the effect of the bad responses would be lost to management.

Also entering into the results is the human tendency (a la student satisfaction questionnaires in higher education) to check responses toward the upper or good end of the spectrum unless conditions are really bad. Further, the usual possibility when data are gathered from workers is present here. That is, the response is partially based on (1) the level of

trust the workers have that their responses will not be tied back to them, personally, and/or (2) the level of trust the workers have that their responses will actually have a positive impact on the work environment.

As an analogy, one of the authors worked for a large electronics firm. Upper management heard the worker morale was bad, so they conducted a limited questionnaire-based data gathering. The results were so bad that upper management decreed that the entire staff would be polled. The results were so bad they were filed away and never heard from again.

One addition to the data collection might have even more interesting results. Unless the workers simply fail to show up for their work shift, an exit interview could be conducted after the employee has received final payment and has little to lose by being honest in answering questions. Also, since it is assumed ICU Medical has the home address of workers, the same address could be used to gather post-employment data. It is suggested this might yield information with less bias than that received while the worker is still employed at ICU Medical and may fear reprisal.

Overall, the results of the research into ICU Medical and its turnover problems yielded interesting, yet unsurprising, results. The workers seemed well satisfied with their work environment, their coworkers, and their supervision. They felt supervisors enforced the policies and procedures equitably, and they were treated fairly, yet they felt they were unfairly treated in relation to their coworkers. In general, their surveyed feelings about ICU Medical were positive. The turnover rate, however, remained at thirteen percent per month. Unfortunately, this tracks well with the research published in 1993, where the Carrillo and Santibanez study found the turnover rate in the Tijuana maquiladoras in 1989 averaged 12.7 percent per month in the areas of electronics, auto parts, and clothing. Thus, in some respects, it appears some things have remained unchanged for almost twenty years.

It is suggested here that ICU Medical management spend some money upfront to seed the way to lower the turnover rate. As long as the maquiladoras continue to flourish along the border, young people will continue to move to the maquiladora cities. They will also continue to follow the "grass is greener" syndrome and jump from job to job as they perceive chances to improve their lot. To break this chain, ICU Medical management must do something to break the company out of the pack as a good company for which to work. The alternative is to continue to fund the revolving door to the tune of a few million dollars per year, U.S., which are monies that could be used to lower costs and improve the business.

Financial Consequences of Turnover

In the early days of maquiladoras, the published low wage rate was touted as the major reason for looking at moving production south of the border. As far as it went, this was correct. The actual hourly or unit costs, however, were different. When the hourly or unit cost was fully loaded with all the relevant costs, including but not limited to additional shipping, insurance, inspection and other quality checks, et al, the cost was generally up to twice the initially quoted cost. The situation with the costs of turnover for ICU Medical is analogous. Analyses of the costs associated with turnover yield surprisingly high estimates. The high cost of losing key employees has long been recognized, domestically and internationally. Using an example from the health care industry, Cascio (2000) calculated that the cost of replacing 288 employees per year (in a hospital with 200 beds employing 1200 persons with a turnover rate of 2% per month) was $2,888,295.52 when all sources of costs were analyzed. Moreover, a 1998 Business Week study estimated that the replacement costs alone are over $10,000 for about half of all jobs and approximately $30,000 for all jobs. However, it is important for organizations to understand that general turnover rates in the workforce can also have a serious impact on an organization's profitability, and even on its survival. There are a number of costs incurred as a result of employee turnover, with some of them very visible and some almost hidden. Some of the costs are easily measurable with traditional accounting methods, and some can only be estimated or acknowledged as costs. They also include personnel costs of ramping up (hiring and getting on the job) and of ramping down (when a person is considering leaving the company, or becoming a voluntary resignee.)

We interviewed the human resources manager of the company to find out the costs related to hiring and replacing a resignee. a few of which

are listed below, and are on a per-person basis and quoted in USD.

1. Recruitment for replacements, including administratives expenses advertising, screening and interviewing, and services associated with selection, such as security checks, processing of references, and, possibly, psychological testing. $300.00.
2. Administrative hiring costs. $100.00.
3. Lost productivity associated with the interim period before a replacement can be placed on the job. $3,000.
4. Lost productivity due to the time required for a new worker to get up to speed on the job. $1000.
5. Lost productivity associated with the time that coworkers must spend away from their work to help a new worker. $500.
6. Costs of training, including supervisory and coworker time spent in formal training, as well as the time that the worker in training must spend off the job. $500.
7. Costs associated with the period prior to voluntary termination when workers tend to be less productive. $1000.
8. In some cases costs associated with the communication of proprietary trade secrets, procedures, and skills to competitive organizations. $2000.
9. Public relations costs associated with having a large number of voluntary or involuntary terminations in the community spreading gossip about the organization.
10. Increased unemployment insurance costs.

ESTIMATED TOTAL ..$8,400.00

It should be noted it is likely the estimates are low. The ripple effects are surmised to add considerable costs to the visible ones. For instance, the effects of seeing a continuing stream of your coworkers leaving, ostensibly for a better job, is bound to have an effect, as is the noting of some of your coworkers leaving their job location in the plant to help train the newer workers. The human worker notes the perceived advantages to the other workers, and wonders why he or she is not so blessed. These conditions have a ripple effect on the morale of the steady workers. In addition, the above costs do not reflect any added quality costs of additional inspection and/or rework, yet it is unlikely the new hires can hold the same quality standards as the more experienced employees.

Assume for the moment that the total of $8,400 US per worker replaced is within an order of magnitude of the actual cost. As noted before, ICU Medical must replace approximately 340 workers per year to maintain 220 workers, taking into account the current turnover rate. This means added costs of (340)($8,400) = $2,856,000 annually.

One of the authors had a master's student who was a nurse recruiter for a large for-profit hospital. He considered himself very successful, since he could quote twenty nurses successfully recruited per month. He never, however, noted or addressed the fact that the turnover rate for nurses at his hospital was over 100 percent per year. Thus, they came in the front door and quickly went out the back door, creating the need for more replacements. Time, money and effort spent in staunching the flow of nurses leaving the hospital could have had a great cost-lessening effect. The same is true for ICU Medical. Suppose ICU Medical took part of the (estimated) almost $3,000,000 annually being spent on worker replacement and improved the conditions for the workers so they did not voluntarily leave. What would be the effect on cost, quality, morale, etc.? We suggest it would be money well-spent.

General Conclusions

The literature on the subject of turnover has shown that many different factors affect the decision of a worker to leave an organization. The level and impact of each of the internal and external aspects of the environment will depend on many geographic, demographic, and organizational factors. That certainly proved to be the case in this study of ICU Medical. Ideally, ICU and other organizations could establish a comprehensive approach to reduce and control the rate of turnover, taking into account the situation of each worker. Practically, that is unlikely, but there are changes that could be made to cut the turnover rate.

The overall objective of the study was to investigate the effect of job satisfaction, type of leadership, and socio-demographic profile of the

worker on the rate of turnover of the direct staff at the ICU Medical maquiladora in Mexico. As perhaps might be expected, the results showed/verified a positive influence of job satisfaction toward lessened turnover, as well as a like positive influence of type of leadership toward lessened turnover. That is, the decision of a worker to leave ICU Medical depended in part on the worker's job satisfaction and the type of leadership she perceived the supervisor to be using. Furthermore, the survey results indicated the socio-demographic profile of the production staff had no bearing on the decision of the employee to continue working for the company. This last result suggests ICU Medical may wish to re-examine its hiring policies and procedures that relate to socio-demographic measures.

The majority of those surveyed felt the company "occasionally" takes into account their comments on the work; yet, the vast majority found the company showed a high level of recognition and appreciation of their work. This seems to indicate they believe they are treated well, but their comments and work suggestions are often not taken seriously. This seems to track the results of most organizations with their "suggestion box" offerings to get feedback from the employees; i.e., they are not really taken seriously by the employees because they are not taken seriously by management. It is suggested here that supervisory and management personnel make a serious effort to establish a system whereby comments and suggestions are received and analyzed by representatives of the administration of ICU Medical.

In the area of equity of treatment at work, most of those surveyed felt they did not receive fair treatment in relation to other employees of the company. Yet, they felt they had good relationships with their fellow workers, felt they were treated fairly overall, and believed they had a positive work environment. This included supervision that was supportive and sympathetic to difficult personal situations, and that provided an equitable distribution of justice according to the rules and procedures at work. The feeling of unfair treatment in relation to other employees, coupled with good feelings about their supervisors, provides an oddity needing further research to get at the root of the anomaly.

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