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Journal of Manufacturing Systems; 2004; 23, 3; ABI/INFORM Global
pg. 204

Case Study on Culture and the Implementation of Manufacturing Strategy in Mexico
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Abstract
Even under the best circumstances, organizational change generates resistance. When the change results from a company in one country purchasing a plant in a different country, the complexity of change management and the resistance to change increase considerably. This case analysis examines one such change effort. Initially, the effort failed because the management of the acquiring (U.S.) firm communicated ineffectively with workers in the acquired (Mexican) plant, failed to establish a reward system that encouraged acceptance of change, and ignored cultural and subcultural differences. However, management quickly learned from its mistakes and made the adjustments necessary to turn failure into success. Implications for cross-cultural change management are discussed.

Keywords: Global Manufacturing, Improvement Methods, Culture

Introduction
Mexico is the number-two exporter to the United States, and the codependence of the two nations is obvious. United States investments in Mexico have grown considerably over the past years, especially since the North American Free Trade Agreement (NAFTA) began promoting industrial development. Initially, many U.S. firms moved to Mexico in search of cheap labor, in spite of evidence that cheap labor itself rarely enables companies to compete successfully in the global marketplace (Adler 1997; Earley 1993; Hamrin 1980). Many of these firms subsequently moved from Mexico to South Asia and Southeast Asia, attracted by even lower wage rates. Other firms have moved to Mexico to establish long-term relationships that secure a profitable place in developing Latin American markets.

A large body of research has demonstrated that cultural values directly influence the success of organizational strategies and managerial actions in global organizations, especially when long-term relationships are desired. Consequently, it is important for all parties involved in international business efforts to understand key differences in national cultures, and the ways in which those differences influence the impact of new technologies and new production techniques.

The case study presented in this paper describes how a U.S.-owned company adapted a manufacturing philosophy to successfully implement it in an acquired facility in Mexico. Two unique characteristics of this case study are that the manufacturing philosophy is of Japanese origin and that the Mexican facility is located in a state with a distinctive subculture as compared with neighboring Mexican regions.

The next section describes how cultural differences can affect organizational changes, with the following sections presenting two phases of the case study. Presented next is an analysis of the case study from the cultural perspective, and finally, conclusions and recommendations are offered.

Culture Differences and Organizational Changes
Organizational change inevitably generates resistance (Deetz, Tracy, and Simpson 2000; Poole et al. 2000; Zaltman, Duncan, and Holbok 1973). In even the best of circumstances, change creates uncertainty and ambiguity, and employees respond to those anxieties in myriad ways, many of which undermine the organization’s objectives (Ashford 1988; Menzies Lyth 1988; Noer 1993). Some changes also carry tangible threats to the status, self-esteem, incomes, or job security of particular groups of workers (Mulder 1977). As a result, even changes that on the surface seem to promise enhanced rewards or working conditions are resisted. When
the changes are sudden; significant; imposed from the outside; involve employees from multiple, different cultures and subcultures; and/or are mishandled by management, the likelihood of resistance increases substantially.

Resistance to change is related to national culture in two ways. First, cultural assumptions influence the way in which multinational corporations approach expansion into a new country or market. There are many possible forms of expansion. In terms of potential cultural integration, the two extremes are (1) "greenfield" starts and (2) acquisitions. In the former situation, a multinational company sends a small group of expatriates into an area to hire locals and gradually build a business. The potential for cultural clash is minimized, and the opportunity for the expatriates to learn the nuances of the new culture is maximized.

At the opposite extreme are foreign acquisitions, in which a multinational firm purchases a local company or plant. Acquisitions are quick but are fraught with potential for culture clash. In the worst-case scenario, the acquiring firm blindly imposes its own way of doing things on members of a very different culture with little consideration of those differences or for the values of employees of the acquired firm:

"Culture clashes are resolved through brute power. Key people are replaced by the corporation's own agents. In other cases, key people do not wait for this to happen and leave on their own account. Acquisitions often lead to a destruction of human capital, which is eventually a destruction of financial capital as well." (Hofstede 2001, p. 45).

As a result, cross-cultural acquisitions tend to fail significantly more often than other forms of expansion, especially when the cultures of the acquiring and acquired firms/plants are substantially different (Barkema, Bell, and Pennings 1996; Kogut and Singh 1988; Li and Guisinger 1992). For a variety of reasons, most of which are related to the political, legal, and economic situation that characterizes the society in which an multinational is based, national culture and mode of intervention are strongly correlated. U.S. firms tend to acquire foreign firms or plants, as occurred in this case study, and tend to place the burden of adaptation on members of the acquired firm/plant rather than accepting that burden themselves (Hofstede 2001; Laurent 1978). In addition, U.S. managers tend to operate on a "one-size-fits-all" approach to day-to-day operations, insisting on using the same strategies and practices that have proven to be successful in other operations (Newman and Nollen 1996). When workers resist change, supervisors tend to attribute their opposition to inadequate training and/or education, even when change is based on insightful analysis of problems with the new program or the way it is being implemented (Zorn, Christiansen, and Cheney 1999).

Although there are notable examples of U.S. firms successfully overcoming these tendencies, albeit often after an initial period of cross-cultural conflict and communication breakdown (e.g., Mann 1989), and there is also evidence that past experience operating in the culture of the acquired firm (or in similar cultures) increases the potential for a successful acquisition, U.S. firms face a unique set of culture-related challenges when they acquire firms or plants in different national cultures.

The potential for resistance is increased by differences in cultural assumptions within organizations. Hofstede (2001) and others have argued that the most important dimension that differentiates national cultures is Uncertainty Avoidance (UA), the intensity with which each culture's members feel a need to avoid uncertainty and the means through which they do so. Unlike fear and risk, which are focused on specific, known threats, anxiety and uncertainty are diffuse feelings of concern for the future.

In general, "technology" (broadly defined as any human artifact) protects people against uncertainties caused by nature, law defends against uncertainty caused by other people, and religion defends people against uncertainties they cannot understand. Organizations manage uncertainties in their environments by taking a short-term, reactive orientation and by attempting to negotiate protective arrangements with sources of environmental uncertainty (e.g., becoming a monopoly or part of an oligopoly, encouraging the creation of protective tariffs or restrictions on competitors). Organizations manage internal sources of uncertainty through the creation of rules of behavior, bureaucratic structures, and rituals (Cyert and March 1963). Cross-cultural differences in either the intensity of feelings of uncertainty avoidance or in terms of mechanisms for managing uncertainty are especially difficult to
manage (Hofstede 2001). For example, rules are used to manage uncertainty in all cultures. But if rules mean different things in different countries, it is difficult to keep the organization together. In low-UA index cultures like the United States ... managers and nonmanagers alike feel definitely uncomfortable with systems of rigid rules, especially if it is evident that many of these rules are never followed. In high-UA index cultures, like most of the Latin world, people feel equally uncomfortable without the structure of a system of rules, even if many of the rules are impractical.... At either pole of the uncertainty avoidance dimension, people’s feelings are fed by deep psychological needs related to the control of aggression and to basic security in the face of the unknown (Hofstede 2001, p. 442).

Although employees in all cultures resist change, the likelihood of resistance is highest in high-UA index cultures. There, change is very destabilizing, especially if it is unstructured, unclear, ambiguous, or makes employees’ futures with the organization more tenuous. Even the act of planning for change is negatively valued because it increases uncertainty. When planning does take place, it tends to be very detailed and short term in focus, based on a narrow range of “relevant” information, and performed by specialists. Each of these characteristics reduces the uncertainties involved in the planning process. Subordinates in high-UA index cultures tend to believe that organizations/institutions are not concerned for the welfare of their employees or members and tend to perceive organizational actions as potentially harmful to those employees (Hofstede 2001, p. 382). As a result, organization-initiated changes stimulate especially high levels of suspicion and anxiety.

The second important cultural difference involves “Power Distance” (PD), the extent to which members of a society view inequalities in power, wealth, and influence as inevitable, just, and positive in that they foster social stability or as a social problem that needs to be minimized or overcome. The United States is a relatively low PD society; Mexico has one of the highest PD scores among the nations that Hofstede and his successors have studied. Moreover, the PD scores of relatively uneducated Mexican workers in routine jobs are significantly higher than the Mexican average (Hofstede 2001, pp. 88-90). At first glance, this relationship suggests that Mexican workers would readily accept changes imposed from the top of their organizations. However, research using the PD concept has found more complex relationships. First, in high-PD societies, employees’ primary ties are to groups with which they are highly familiar and closely affiliated. These “in-groups” include other people from their families or with the same backgrounds, training, class, and experience (Zurcher, Meadow, and Zurcher 1965). Security stems from these relationships, not from organizational rules or structures. Consequently, change is acceptable if it is supported by dominant members of workers’ in-groups; it is likely to be resisted if imposed by members of “out-groups,” especially if the out-group is composed of foreigners or members of a different race. Organizational policies and practices must be legitimized in terms of the values of the workers’ in-group, and must be accepted by ranking members of that group (Hofstede 2001, p. 97). Decision making is expected to be personal and political, rather than “strategic” or “rational,” and filtered through dominant in-group members.

Organizational theorist Stewart Clegg (1989) (also see Hobbes 1962) has pointed out that as early as the Renaissance Western society grappled with two very different views of social power. One view, based on the ideas of Thomas Hobbes, depicts power and decision making as unemotional, scientific processes. Decision makers function as dispassionate legislators, making rational choices among alternative courses of action. Described in mechanistic terms, decisions, and the inevitable exercise of power that accompanies them, are legitimate if they fulfill the standards of science. When applied to organizations, this perspective suggests that managers should think strategically, rather than politically, and act via plans that are guides by formal rules. Subordinates will be persuaded to accept managers’ decisions through rational processes of bargaining and reasoning based on practical considerations. When policies or programs fail, the outcome is attributed to systemic factors.

Alternatively, a Machiavellian perspective views power and decision making as inherently political, strategic processes. Decision makers take on the role of an interpreter of multiple, conflicting political pressures. Power is located in patterns of coalitions and interpersonal relationships, and its exercise is
legitimate if doing so successfully manages those pressures. Managers persuade their subordinates through relational appeals and rely on interpersonal ties with their subordinates to obtain support for their decisions. In high-PD, Machiavellian societies, when policies or programs fail, the person(s) at the top of the organization is assumed to be responsible for those failures (Hofstede 2001, p. 382). Over time, Hobbesian views of power came to dominate the low-PD cultures of Britain and northern Europe; Machiavellian perspectives were more acceptable in high-PD cultures such as those of southern Europe and the Mediterranean (Hofstede 2001, especially chap. 3).

Consequently, the acquisition of the particular plant outlined in this paper by a U.S. multinational promised to be exceptionally challenging. Typical methods of managing acquisitions, while consistent with U.S. cultural norms, are very much incongruent with the interpretive frames of employees in the acquired firm. Those differences, and the standard acquisition process, are likely to create high levels of uncertainty and anxiety for employees whose national culture makes uncertainty avoidance paramount. There are, however, cultural characteristics that the acquiring company could use to facilitate the transition. For example, in Mexico, establishing a more personal relationship between supervisors and workers is particularly important to establish loyalty between them. Also, everyone works mainly to get the money to live a life they can enjoy; hence, if the company relates the system objectives with an economic benefit to the employees, they are likely to work harder to achieve them. Training is fundamental for the implementation of new systems. Companies in Mexico should invest heavily on training if they want to succeed. For instance, relative to Americans, Mexicans are initially more reluctant to work with a stranger; however, once trust is developed they will be very loyal to the team. This suggests the importance of team training, in particular on team formation stages, when dealing with Mexican companies (Earley 1994). U.S.-Mexican cultural differences do not doom acquisitions to failure; instead, the differences suggest that cultural sensitivity and cultural adaptation by both parties is especially important to the success of the venture.

**Case Study, Phase I**

USA Home Products (USAHP) is an American multinational company that manufactures family, personal, and household products (the company name has been changed and the specific product unspecified for confidentiality reasons). This company has been in Mexico for more than 40 years. USAHP markets more than 200 brands to nearly five billion consumers in more than 140 countries. It has more than 100,000 employees in more than 80 countries around the world. USAHP is unique when it comes to innovation; it believes in creating a connection between what consumers want and what technology can deliver. USAHP revenues are on the order of $40 billion per year.

To further expand its activities, USAHP purchased a plant in Axcala, Mexico, from a Mexican group called PAMEX. At the moment, this plant has more than 500 employees and has a production of a million cases of products per month. The plant has state-of-the-art technology with almost completely automatic lines. The two companies had very different ways of conducting business. PAMEX management believed that its employees should learn by experience and trial and error. PAMEX hired local employees, more on the basis of established relationships than on education and expertise. As a result, many of its employees had only an elementary education. On the other hand, USAHP relies heavily on systematic training and expertise when it makes hiring decisions, and only hires people who have at least some technical education. It prefers to hire outstanding new graduates who have studied in selected universities (mostly private universities), and it requires them to be very proficient in both written and spoken English. Selection decisions are made through a standard U.S. process—applicants are given a test to measure their ability to solve problems and then the few who pass that test go through a series of interviews.

As a result, getting a job in the Axcala plant became much more difficult than before, especially for local people. The region where the plant is located has some technical schools that supply the labor force for local industries, however, the area lacks good universities. Therefore, USAHP largely recruited its new administrative personnel from neighboring, more developed, and culturally distinct (Mexican) states. Workers at the PAMEX plant suddenly were confronted by newcomers who were both outsiders (either U.S. citizens or from neighboring states) and different in terms of their backgrounds, education,
and experience. Expatriates from the U.S. were doubly alien—they were U.S. citizens and they also chose to live in neighboring states because of its more attractive climate and educational institutions.

For the managers and engineers remaining from the previous company, the culture change accompanying USAHP’s acquisition of the Axcala plant was enormous. Most of the employees felt, accurately, that their jobs were in jeopardy because of the remarkable differences in philosophy between the two companies. PAMEX promoted, rewarded, and retained employees based on their loyalty to the firm and to their immediate supervisors, and based on interpersonal (usually family) connections. In contrast, USAHP’s policy was to hire technical experts to start as supervisors and then grow within the company up to managerial positions. Similar differences were apparent in the reward systems of the two companies. Under PAMEX, managers’ salaries were based on their friendships with the owner or the board of directors of the company. As a result, their salaries were far larger than the USAHP salary structure allowed, given their training, performance, and experience. Meanwhile, most of the technicians had salaries that were far below USAHP’s standards. To bring the new plant into line with company standards, USAHP froze the salaries of the overpaid managers and fired those whose jobs were primarily based on their personal relationships with the previous owners. The managers whose salaries were frozen were unhappy with the change, but they were happy to keep their jobs. However, one of USAHP’s first steps raised questions about the fairness of the company’s reward system. Employees in all cultures view fairness as an important aspect of worker-organization relationships and react negatively to actions that they perceive are unfair (Leung 1987; Leung and Li 1990). However, the way in which “fairness” is defined varies across cultures, focusing on in-group relationships in Mexico and on “objective” assessments of credentials and performance in the United States.

In sum, in the new plant, rewards, promotions, and retention were based on objective measures of individual performance. Each of these changes was appropriate given the strategic model within which USAHP operated. But, for PAMEX employees, the changes created uncertainty and ambiguity and directly threatened their job security. To make matters worse, the changes were imposed by outsiders, who in many ways had thus inadvertently exaggerated their alien status. As a result, the changes created an exceptional level of uncertainty for employees whose society is especially focused on uncertainty avoidance.

**Implementing the Total Productive Maintenance Concept**

The new owners also required operators to learn a whole new way of working. Workers were accustomed to being mere button pressers and were not required to write or document anything. With USAHP, the workers had to change their everyday practices and adhere to strict working standards that required constant documentation. As a result of these changes, many of the older workers accepted voluntary retirement packages because they just could not adapt to the new working systems. The ones who remained found ways to delay or short-circuit the implementation of the change.

USAHP uses Total Productive Maintenance (TPM) in its plants to remain competitive. TPM is a manufacturing strategy of Japanese origin that includes different working methodologies. Each company will decide which methodologies to use, but most companies include the following:

- Focused Improvement
- Autonomous Maintenance
- Planned Maintenance
- Education and Training
- Quality-Focused Maintenance
- Administration and Support
- Safety

Autonomous Maintenance (AM) is the backbone of TPM. The general objective of AM is to hold workers responsible for performing daily maintenance on their machinery. The main objectives of AM are:

- Avoid accelerated deterioration of equipment by using it correctly and making daily inspections.
- Return equipment to its initial operating conditions.
- Establish necessary conditions to keep equipment well maintained at all times.
- Use equipment as a means to teach new ways of thinking and working.

The AM methodology consists of seven sequential steps:

1. Initial cleaning.
2. Elimination of all pollution sources and difficult-to-reach places.
Step 3. Establish standards of lubrication, cleaning, and bolt tightening.
Step 4. Inspect the equipment.
Step 5. Inspect the processes.
Step 6. Systematic AM.
Step 7. Self-administered system.

The First Years of AM in USAHP Axaca

To begin the AM implementation, USAHP started training at the top managerial level as a way to convince the rest of the plant that autonomous maintenance was so important that even managers would get their hands dirty working on the machines. For the startup of AM, all the leaders of the plant including the plant manager cleaned their assigned workcenters and documented the status of their work. The next step was to involve all of the plant to work in autonomous maintenance. An exchange of personnel from different sites where AM was already in place was promoted. The company provided all the necessary equipment, such as computers, for exclusive AM use. Autonomous maintenance was first applied to those operations and equipment identified as most critical for the manufacturing process. On the one hand, one would expect top-down change fostered by recognized experts to be readily accepted by members of a high-power-distance (PD) society. However, the key personnel involved in this change were outsiders, not members of the operators’ existing ‘in-groups.’

Ruben Salas was the AM leader chosen by the plant leadership team. He was transferred from another Mexican site where autonomous maintenance had been implemented successfully. Forty teams were formed to pilot the AM project. However, from the beginning, Salas had leadership problems with the production department. Arturo Suarez was the production department’s manager. He was local to the region, had worked in the factory for over 10 years, and had gained the respect of the workers in the plant. Suarez started as a supervisor when the plant was owned by PAMEX and worked his way up to his current position. Suarez was under constant management pressure to meet the production requirements set by the sales department. As a result, he opposed having the department’s employees go to AM training sessions because their absence could jeopardize meeting production quotas. The production workers also noticed that the managers could not come to an agreement on the importance of autonomous maintenance. The new managers had no direct experience on the shop floor and could not produce persuasive evidence of the positive effects of the system on the workers’ lives. As a result, the workers decided to listen to Suarez, the boss with whom they had worked for more than a decade and whom they were loyal to. They did not embrace the autonomous maintenance philosophy and thought that cleaning the equipment was pointless because ‘it would get dirty again anyway.’

During this time, the company struggled to provide AM training to its employees. The employees were negatively influenced by Suarez, never understanding why they had to go to training. It seemed like a waste of time to them, and they chose not to go or showed up late. In fact, the implementation of AM seemed to penalize the operators because it eliminated their piece-rate reward system, and now they could not blame the maintenance group for any production losses due to machine breakdowns. They believed it was unreasonable for the managers to ask them to fix their own equipment when they had no maintenance experience and previously had been served by a specialized maintenance department. Furthermore, they thought there was no reason to change the current methods because ‘they had worked fine’ all this time for PAMEX. In summary, the workers had no incentives to implement autonomous maintenance—and had significant disincentives for doing so. As often observed in intact groups with long histories of working together, the resistance was not individual but collective (Salancik and Pfeffer 1978).

The workers’ resistance to AM was also related to the ambiguity of the system itself. There are no predefined, detailed recipes on how to apply AM. Instead, the methodology relies heavily on active worker involvement, a common feature of many methodologies of Japanese origin. For instance, the guidelines state that one should achieve zero defects without explicitly saying how to achieve that goal. The methodology states that every member of a work group is responsible for finding and implementing new solutions. In contrast, Mexican workers are culturally predisposed to obey established rules procedures and to follow a leader. Both predispositions provide stability and protection in
uncertain situations. Because most of the workers from PAMEX had, at best, elementary school educations, the new managers decided that the work standards and procedures should be created from the supervisor level instead of from the workers themselves, as required by AM. Although planning by specialists is expected in high-PD societies, the respect afforded them depends on the expertise they demonstrate, the success of their efforts, and their ability to create detailed designs and short feedback loops that minimize uncertainty (Hofstede 2001, p. 382). These operators laughed at the standards created by the outside experts because it was obvious that the supervisors did not know how the “real world” was. Without a demonstration of relevant expertise and success, the advantages granted to superiors in high-PD cultures become disadvantages.

During this initial attempt to implement AM, the combination of cultural preferences and a badly designed reward system probably doomed the system from the outset. After two and a half years, only six groups out of 40 had progressed enough to be moved to step two of the seven-step AM methodology procedure.

Interpretation of Phase I

In many ways, Phase I of the Axcalan acquisition provides a textbook case of the kinds of problems involved in operations across cultures. In those cases, the U.S. firm attempts to change Mexican operations, which inevitably engenders resistance. As Kirkman and Shapiro (1997) conclude:

“Change agents, who often are U.S. born because so few host nationals have experience with the latest North American management initiatives (Appelbaum and Batt 1994), can make cross-cultural mistakes when working in foreign affiliates, leading direction to employee (change target) resistance.” (p. 735)

However, Hofstede (2001) notes that “textbook” interpretations of intercultural encounters often overgeneralize cultural tensions and ignore complexities and nuances. In Phase I of this case, two complications were especially important. The first complicaton involved the local culture of Axcalan, which is special even within Mexico. Axcalanans are a closed society, distrust foreigners, and are very traditionalist and regionalist. This distinctiveness has it roots in pre-colonial times. The people of Axcala were never subordinated by the Aztecs. Later, they allied with the Spaniards in the conquest of the Aztecs, obtaining special treatment during colonization (Rendón 1996). In contrast, the neighboring provinces readily accepted Aztec control; they are an economically wealthier and culturally distinct people who in the past have been enemies of the Axcalan people. USAHP expatriates chose to live in neighboring provinces for wholly rational reasons—the climate, intellectual attractions, and quality of schools for their children. We found no evidence that USAHP’s management knew that Axcalanans are exceptionally sensitive to incursions by “outsiders,” or that they perceive their neighboring Mexican states and the people who live there as especially alien, or that upsetting a tradition of employment and advancement through interpersonal/family relationships would seriously threaten the core of Axcalan culture and the organizational culture of the plant. But, when USAHP management made those choices and hired new employees from those areas, it exacerbated the problems created by differences between national cultures.

The second complication involves the concept of power distance (PD). Scholars and practitioners alike generally have interpreted power distance as a preference for hierarchy and an acceptance of top-down leadership. But, from the beginning of Hofstede’s work, it has been clear that the concept is mediated by the distinction between ‘in-group’ and ‘out-group’ ties. Similarly, while the PD factor is statistically independent of uncertainty avoidance, the two factors overlap in practice. Change creates uncertainty. In some cultures, the anxiety that stems from change is managed through interpersonal ties. When the changes circumvent or undermine those ties, uncertainty is increased. USAHP’s decision to bring a large numbers of outsiders, to make radical changes in personnel and the hiring/reward system, and to suddenly impose a new production system with little explanation magnified the uncertainty further. In short, USAHP acted in ways that maximized uncertainty in a culture in which uncertainty avoidance is highly salient. As a result, it was very difficult to have the workers themselves develop and improve their rules, procedures, and standards as required by the autonomous maintenance (AM) methodology.
Case Study, Phase II

After two and a half years, USAHP’s management realized that its efforts to implement AM at the Axcala plant had failed. This realization is important in itself because there is abundant evidence that managers of U.S. firms tend to persist in failing courses of action long after there is abundant evidence that they indeed are failing by demanding that the host culture do all the changing (Tégar 1980). To the credit of USAHP management, it accepted the failure and changed to implement more culturally sensitive strategies developed with the intervention of personnel with experience in the local culture.

The transformation began when the company implemented a new reward system based on clearly stated objectives and performance standards. Clearer working standards were created for autonomous maintenance, including a new audit system where everyone was held directly accountable for their participation in AM activities. New procedures and metrics to evaluate the involvement of the personnel in autonomous maintenance were implemented, such as attendance at AM-related meetings and activities. All AM teams now meet each week to share their results and assign each member with specific responsibilities. Each employee’s ranking, promotion, and salary in the company depend on the level of commitment they have shown to autonomous maintenance. The operators still have a lot of pressure to produce, but now they have pre-established hours to receive training in AM. Teams are rewarded with small prizes for achieving the set goals. Special recognition is given to those completing important milestones in the Total Productive Maintenance (TPM) process. Just as important, the team itself decides when to be audited and what its objectives are. Before the team is audited, it has a pre-audit using the same criteria used by the real auditors. If the team covers at least 90 points out of 100, then the team is said to be ready for audit. The audit can be done by any plant worker who is already certified in autonomous maintenance, including the plant manager.

In this particular situation, workers from the previous company were tightly bonded by traditional Axacalan regionalism and by Arturo Suarez’ leadership role, which resulted in rejection of the changes required for TPM implementation. Suarez was relocated to a nonproductive area where he could still be accessible for his valuable technical expertise. Juan Ruiz, an experienced AM manager who is committed to the process, replaced Suarez as the AM team leader and new production manager. Giving the same person both roles helped eliminate conflicts and uncertainties. The new system also used existing in-group relationships to the company’s advantage. Ruiz’ immediate subordinate is Campos, an old PAMEX supervisor who is supportive of the AM initiative. Ruiz trained three technicians, who were put in charge of autonomous maintenance in the different production areas of the plant. These technicians will, in turn, pass on the knowledge to the workers in their corresponding areas. A new leadership team was formed, which included members from all of the production areas. New subcommittees were created in each area, composed of a functional leader (a worker with AM experience), the leader of the area, and a Planned Maintenance (PM) planner.

In the incorporation of other TPM components, such as Planned Maintenance, care was taken to establish a hierarchy of team leaders who had previous experience and who were committed to the TPM program. The members of each shift form their autonomous maintenance teams and work on a specific machine in their area. There is a central leader who is one of the three technicians responsible for the areas. Each of the operators is responsible for his or her machine. The responsibility includes operating the equipment, documenting the problems observed, and repairing minor faults. Examples of minor faults are changing belts and/or plates, tightening bolts, and lubricating bearings. For major defects, the operators prepare a list that is passed to the central technician. The central technician collects all of the lists and sends them to the production department. Whenever there is a general planned stoppage of the plant, all AM teams work in the maintenance of their respective equipment. The responsibility of the previous maintenance team was limited to specialized and complicated maintenance activities; therefore, they are not responsible for routine maintenance activities.

Another important change was consideration of the operators’ educational level. In Phase I, this became a source of increased uncertainty and resistance. Educational level was critical to the
The success of the program because TPM requires that workers document processes and process improvement solutions. Once the workers became involved in the program, they understood why it was important. It was now possible to apply statistical quality control tools such as control charts to register the total defects found versus the defects repaired in all the plant. Additionally, workers had to fill in a daily form to check if the cleaning standards are being followed. Today, there are 38 teams who have been certified in step 1 and two teams who have been certified in step 2.

**Case Study Analysis**

Years of delays in the successful implementation of autonomous maintenance could have been avoided if USAHP’s management had had a better understanding of PAMEX’s national and regional cultures. In particular, the case study illustrates differences among U.S. business and Mexican and Axcalan cultures in uncertainty avoidance and power distance as related to rules, leadership, teamwork, work ethics, and workforce educational level. This section will discuss these differences and their impact on Total Productive Maintenance (TPM) implementation.

The new reward system uses rules to manage worker uncertainty, instead of using the relationship culture of Axcalan. The rules themselves are clear and known to all and are a welcome improvement over the ambiguities and uncertainties of the past two and a half years; however, just as importantly, the rules are implemented in a manner that relies on in-group links instead of threatening them.

A main flaw in the initial attempt to implement TPM was that USAHP overlooked how differently people in U.S. and Mexican cultures relate to leaders in a company—that is, power-distance (PD) differences. The initial resistance to implement autonomous maintenance (AM) was very high because of the failure to recognize the importance of getting ‘in-group’ leaders (such as Arturo Suarez) to wholeheartedly accept the TPM philosophy, and the failure to recognize that the workers were not responsive to the expertise, status, or power of outsiders. The workers were culturally predisposed to follow Suarez as a local leader. In the second attempt, USAHP eliminated this resistance by removing Suarez from the leadership.

Another cultural issue disregarded by USAHP in the initial implementation was the different predisposition that Americans and Mexicans have for working in self-managed teams. In the U.S., most people leave their parents’ home early in their lives, either to go to college or once they get their first jobs after high school graduation. It is very different in Mexico, as in most Latin American cultures, where most people live with their families until they get married, even if this is long after they could be financially self-sufficient. So, early in their lives, U.S. workers learn to trust coworkers with whom they have no personal or family relationship, while Latin American workers are more used to the security of being surrounded and supported by family and tend to distrust strangers. As a result, Americans are more predisposed to rapidly become effective working in teams, while it may take longer for Mexicans to trust arbitrarily assigned teammates (Earley 1994). Conversely, the extreme individualism of American culture makes it difficult for those from the U.S. to understand the responses of more community-oriented cultures like those of Latin America (Hofstede 2001). The United States has the highest ranking in individualism when compared to every other country in the study; Mexico scores on the opposite side of the same scale. In the workplaces of an individualist society, ‘others’ are seen as ‘resources,’ and ‘tasks’ prevail over ‘relationships,’’ making teamwork a natural work method. It is conjectured that this difference is more obvious in less-educated layers of the society, thus the significant resistance of the workers to outsider-managed teams in the USAHP case. In the second attempt, USAHP gave more power to the team leaders, and the reward system directly penalized team members for not participating in the autonomous maintenance program. Kirkman and Shapiro (1997) state:

> “North American managers are likely to encounter cultures that might be receptive to teams (i.e., low in individualism) but not necessarily to self-management (i.e., high in power distance, being orientation, and determinism) in such countries as Malaysia, Indonesia, the Philippines, and Mexico (p. 750).”

The former type of system, like the one used by USAHP, largely maintains a centralized structure of power and authority. As a result, it is the kind of system that one would expect to be minimally upsetting in a culture with high-PD. USAHP’s
management modified its implementation of some autonomous maintenance methods to those that were more appropriate to the Axcala plant. The specific modifications to the AM methodology are summarized in Table 1. Because the company’s initial goal was to use the same practices in all of its plants, this willingness to adapt is both surprising and a credit to its management. The results suggest that successful implementation would have occurred sooner if those involved had recognized the impact of regional cultural differences from the beginning.

Table 1  
Summary of Differences in Total Productive Maintenance (TPM)/Autonomous Maintenance (AM) Implementation Between U.S. and Mexico

<table>
<thead>
<tr>
<th>TPM/AM Implementation</th>
<th>In the U.S. (Standard)</th>
<th>In Mexico</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment of team</td>
<td>All team members are equally responsible</td>
<td>Team leader must play a more active role</td>
<td>More paternalistic nature of the Mexican — more power distance</td>
</tr>
<tr>
<td>responsibilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team formation</td>
<td>Basic team training sufficient</td>
<td>More emphasis in team training necessary, with</td>
<td>Americans are more used to interacting with others outside of their ‘in-groups’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>special attention to team training</td>
<td></td>
</tr>
<tr>
<td>Performance appraisal</td>
<td>Recognition of achievements works</td>
<td>Recognition of achievements must be</td>
<td>Mexico is a poorer country</td>
</tr>
<tr>
<td></td>
<td>well</td>
<td>accompanied by more material compensation</td>
<td></td>
</tr>
<tr>
<td>Standards and rules</td>
<td>Standard and rules serve as guidelines</td>
<td>Standards and rules are needed to provide a</td>
<td>Higher uncertainty avoidance of Mexicans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sense of security</td>
<td></td>
</tr>
<tr>
<td>Japanese continuous</td>
<td>People accept continuous</td>
<td>People need to be taught more about the</td>
<td>Mexican workers prefer to be told what to do: high uncertainty avoidance</td>
</tr>
<tr>
<td>improvement</td>
<td>improvement as part of the job</td>
<td>benefits of improving what is already working</td>
<td>and power distance</td>
</tr>
<tr>
<td>Training for procedures</td>
<td>A must</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting times and due dates</td>
<td>To be on time is part of the culture</td>
<td>Being on time must be taught</td>
<td>Americans tend to be short-term, results oriented; Mexicans have to think</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>more long-term; they place more importance on relationships</td>
</tr>
<tr>
<td>Technical training</td>
<td>Additional training may be required</td>
<td></td>
<td>Education level in Mexico is lower; skill-level definitions are not</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>equivalent</td>
</tr>
<tr>
<td>Initial cleaning</td>
<td>Deep and continuous cleaning of the</td>
<td>Before this step, there is a negotiation</td>
<td>Collectivistic societies need to share a vision</td>
</tr>
<tr>
<td></td>
<td>equipment</td>
<td>with the workers’ union to share the system</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>objectives. There is also training</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>involved to teach the workers how to</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>fill out the forms properly. A lot</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>reinforcement is needed.</td>
<td></td>
</tr>
<tr>
<td>Inspection of equipment</td>
<td>Workers inspect their own machines</td>
<td>From time to time, the AM leader inspects</td>
<td>Paternalistic culture in Mexico</td>
</tr>
<tr>
<td></td>
<td></td>
<td>all equipment</td>
<td></td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>Team members make suggestions to</td>
<td>Leaders should expect to be more</td>
<td>Skill level of the worker may be lower in Mexico</td>
</tr>
<tr>
<td></td>
<td>improve the process</td>
<td>involved in reviewing the suggestions</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions and Recommendations

To fully understand the Mexican culture, one needs to differentiate among the regions of the country. Experts in intercultural communication have recognized for some time that treating a nation as a homogeneous culture is unwise (Dowling and Schuler 1994; Kirkman and Shapiro 1997; Stohl and Cheney 2001).

USAHP made a rational decision to apply a production system that had been successful in its
other plants, including some in Latin America, to its new acquisition in Acula. Increasing the educational level of its workforce, redesigning its reward system to focus on productivity rather than interpersonal ties, and implementing a proactive system of equipment operation and maintenance all are consistent with modern management and operations theory. Additionally, there is no sense that, even if USAHP had been thoroughly knowledgable and exquisitely sensitive to the overall differences between Anglo-U.S. and Mexican cultures, it would have understood and adapted at first to the nuances of the local culture of the Aculan plant.

Fortunately, USAHP was willing to recognize that its change effort was failing and to make appropriate adjustments, something that is unfortunately rare among U.S. organizations (Tegar 1980). As a result, USAHP was able to succeed when it had been on the brink of failure. Finally, just to highlight the importance of the cultural aspects when trying to implement a new manufacturing system, since the new implementation the company has been able to reduce machine stoppages by more than 50%, which can represent significant savings for the company running a high-volume, continuous process.

References


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