

The Impact of Organizational Culture on the Management of Technology in Developing Nations

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Abstract

Management of Technology (MOT) is critical to the current survival and future development of most all business ventures in today's global business environment. This is especially true of organizations in or working in Developing Nations (DN). Although there is a wide range of complex issues that impact MOT in any organization, whether in a developing nation or not, a large number of studies mention the need to develop a "technology culture." The issue of organizational culture has been a long-standing area of research in the more traditional business management research. This has not been the case in MOT and even less so in MOT for developing nations. This is partly due to the fact that MOT as an academic research area is still relatively new, thus MOT in developing nations is even more so. In addition to this, organizational culture research done on MOT in developing nations is compounded by the fact that the culture of the business or organization is imbedded within the overarching multicultural international business environment. This paper looks at these issues and develops a conceptual model in which to deal with this promising and much needed area of research.

Keywords: Management of Technology, Organizational Culture, Developing Nations

MOT in Developing Nations and Organizational Culture

The Management of Technology (MOT) is a recognized and for the most part accepted area of industrial practice and educational research in engineering and business. Most of the critical subjects (i.e., management issues, technology transfer, human resource management, quality management, etc.) are dealt with in the MOT literature in the same manner as in the engineering and business literature. That is, they are areas of concern which are recognized and dealt with in both the research and industrial practice arena. One subject matter that is well developed in the business literature, organizational culture, seems not to be as well addressed in the MOT literature. There may be several reasons for this. First, MOT is rather a new subject matter when compared to the overall business and engineering specialties. Organizational culture being a "soft issue," it is not hard to understand why other issues (more tangible issues) have been addressed first by MOT practitioners and researchers. Secondly, MOT in developing nations (DN) has the added burden of dealing with the non-organizational culture aspects that are inherent in international business problems.¹ Even with this understanding, there is no doubt though that the impact of cultural issues and specifically organizational culture issues cannot be avoided indefinitely in the scope of the management of technology.

¹ The organizational culture of a specific organization is undeniably influenced by the overall (general) culture of the physical location in which the company is operating. Thus, for example, the organizational culture of an organization in Egypt is influenced by the cultural norms and "modus operandi" of the Egyptian culture itself.

To better deal with the issue being developed in this paper, we need to look at several definitions that may assist our thoughts. A dictionary definition of culture is, “the integrated pattern of human behavior that includes thought, speech, action, and artifacts and depends on man’s capacity for learning and transmitting knowledge to succeeding generations.” Though this is a general definition, we can see some crucial aspects that will translate to organizational behavior.² That is, behavior in any culture (organizational, national, family) to some extent is socialized (taught to its members) so that the patterns of behavior, thought, speech, action, etc. are normalized to what the overall culture deems acceptable.³

Edgar Schein (1985) is generally considered the father of organizational culture. The issue of culture is complex and profound; “the idea that culture is a deep phenomenon, that culture is complex and difficult to understand, but that the effort to understand it is worthwhile because much of the mysterious and the irrational in organizations suddenly becomes clear when we do understand it,” (Schein, 1987; p. 383). All MOT practitioners and researchers, especially those who deal with MOT in developing nations, fully understand the impact of culture and know they must deal with it, but would be hard pressed to articulate clearly what it is (define it) and the specific characteristics or tasks they need to address on this critical issue. Here Schein can be of some help. He defined organizational culture as follows,

a pattern of basic assumptions - invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration - that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems, (Schein, 1987; p. 385).

What is often overlooked is that cultural norms, in an organization or other entity, exist because they have been successful. Their success is the reason for their institutionalization. That is, they have helped the group with “external adaptation” and “internal integration” in such a way as to be “standardized” and passed on to succeeding generations. A summary of the points of Schein’s research (reasoning behind the research) on organizational culture is presented in Table 1.

Deal and Kennedy (1982) are also a couple of researchers who have contributed much to the knowledge on organizational culture.⁴ One of the more interesting parts of the work of Deal and Kennedy is the description of the five Elements of Culture: (1) the business environment; (2) the organizational values; (3) the corporate heroes; (4) the rites and rituals of the corporation; and (5) the cultural network of the organization. See Table 2 for a summary description of the five elements. The researchers believe that corporations can have a varying degree of strong to a weak culture, and that a strong (not overbearing) culture is in fact better than a weak culture. They suggest that a strong culture can be a powerful lever to help guide behavior by helping employees to do their work better along two directions: (a) a strong culture is a system of informal rules that spells out how people are to behave

² Deal and Kennedy (1985), state that an informal and concise definition geared towards business is “the way we do business around here,” (p. 4).

³ From another standpoint, knowing well the culture helps an individual to be accepted more readily and even predict the behavior of the members of that culture.

⁴ Much of the work of Deal and Kennedy was done while working with industrial corporations at McKinsey and Company. They had firsthand experience with a wide variety of corporate cultures.

most of the time, and (b) it enables people to feel better about what they do, so they are more likely to work harder, (Deal and Kennedy, 1982). In other words, a strong culture helps to reduce workplace uncertainty. These issues are of course relevant to all types of organizations. The question that comes to mind is how relevant is it to Management of Technology especially in the Developing Nations arena where the corporate culture and the local culture (of the international marketplace) come together? This is in essence the driving question of the current research effort being conducted at Texas Tech University on MOT in developing nations.

Table 1. Summary of Objectives to Organizational Culture Research (Adapted from Schein, 1987).

Critical Points to Schein’s Research on Organizational Culture	
1.	Provide a clear, workable definition of organizational culture that takes into account the accumulated insights of anthropologists, sociologists, and psychologists.
2.	Develop a conceptual “model” of how culture works - that is, how it begins, what functions it serves, what problems it solves, why it survives, why and how it changes, and whether it can be managed and, if so, how.
3.	Show how culture, as a conceptual tool, can illuminate individual psychological behavior; what goes on in small groups and in geographically or occupationally based communities; how large organizations work; and how societal, multinational issues can be better understood through increased cultural insight.
4.	Show how culture and leadership are really two sides of the same coin. One cannot understand one without the other.

Conceptual Analysis

To address this question it might be good to look at several examples of current work conducted under the authors supervision, to get a better picture of the effects that culture has on MOT. Two research efforts (DeHoyos, 1994, and Hutchinson, 1995) were conducted on the maquiladora industry in Mexico. Also known as Twin-Plants, these are mainly production operations found mostly along the US-Mexico border. The first study (DeHoyos, 1994; DeHoyos and Beruvides, 1996) looked at a comparative study of productivity between a twin plant setup. The second study (Hutchinson, 1995 and Hutchinson et al., 1997) looked at the problems of high turnover rates in the maquila

Table 2. The Elements of Culture (Adapted from Deal and Kennedy, 1982).

Cultural Element	Description
Business Environment	Each company faces a different reality in the marketplace depending on its products, competitors, customers, technologies, government influences, and so on. To succeed in its marketplace, each company must carry out certain kinds of activities very well. In short, the environment in which a company operates determines what it must do to be a success. This business

	environment is the single greatest influence in shaping a corporate culture.
Values	These are the basic concepts and beliefs of an organization; as such they form the heart of the corporate culture. Values define “success” in concrete terms for employees - “if you do this, you too will be a success” - and establish standards of achievement within the organization.
Heroes	These people personify the culture’s values and as such provide tangible role models for employees to follow. Some heroes are born - the visionary institution builders of American business - and some are “made” by memorable moments that occur in day-to-day corporate life. Smart companies take a direct hand in choosing people to play these heroic roles, knowing full well that others will try to emulate their behavior.
Rites & Rituals	These are the systematic and programmed routines of day-to-day life in the company. In their mundane manifestations - which we call rituals - they show employees the kind of behavior that is expected of them. In their extravaganzas - which we call ceremonies - they provide visible and potent examples of what the company stands for.
Cultural Network	As the primary (but informal) means of communication within an organization, the cultural network is the “carrier” of the corporate values and heroic mythology. Working the network effectively is the only way to get things done or to understand what’s really going on.

operations.⁵ Some of the issues faced in these studies, that might typically not be confronted in a non-multicultural/multinational study, are such things as excessive grow rate issues, border shipping issues, international legal issues, differing views by workers on overtime, turnover, absenteeism, etc. For example, the maquiladora industry experiences labor growth rates in several years of up to 50%. This rapid growth has resulted in poor infrastructure, a lack of training, and outdated technology. In addition to this, the industry has put severe strain on border region infrastructural capacity creating serious shortages in housing, sewage disposal, and electrical power availability, (DeHoyos, 1994).

From a management standpoint we see severe problems like turnover rates of from 8 to 10% per month (Salopak, 1991; Williams and Passe-Smith, 1989). This is in contrast to the US average of about 1 to 2% per month.⁶ The even more interesting part of the turnover issue is that there is a transient population of workers in and out of the industry who are mainly farmers that go to the city in hard financial times, but return home once enough money is seemingly collected. Other workers due to the low wages, job-hop to increase the income at times by small amounts. This has a devastating effect on management plans and there is certainly little to no organizational loyalty.⁷ These situations create clashes between the organizational culture and the local culture. The truth of the matter is that we know little to nothing on the characteristics, mechanism and impact that these culture issues has on the management of technology. These problems are more prevalent in developing nations.

⁵ The high turnover rates in Maquiladoras is also explained in Villalobus et al., 1997 and Beruvides et al., 1997.

⁶ Some Maquila organizations experience turnover rates of over 120% per year.

⁷ There is no doubt, from a systems perspective, that management in some cases may be the creators of their own problems. But many of the issues are cultural.

Conclusion

This can certainly not be a conclusion section, because there is nothing to conclude and everything to commence. There is a leadership issue involved here. As Schein states (with respect to organizations), “there is a possibility - underemphasized in leadership research - that the only thing of real importance that leaders do is to create and manage culture and that the unique talent of leaders is their ability to work with culture,” (p. 381). There may be a leadership issue in our research of MOT with respect to developing nations. In a recent survey of MOT experts (Beruvides, 1997), one of the concerns raised was that professional associations, such as IAMOT (International Association for Management of Technology), need to work on the educational issues (build the knowledge base) of the concern that specifically impact MOT in developing nations. Organizational culture in MOT with respect to developing nations can be visualized as a buildup of concentric circles of influence (see Figure 1). From a research standpoint, the characteristics and influences of each layer on the other needs to be examined. What is the structure of organizational culture in MOT ventures in developing nations? What issues are similar to traditional organizational culture? Which are different? These and many other questions are the challenge that MOT practitioners and researchers will need to face in the coming years.

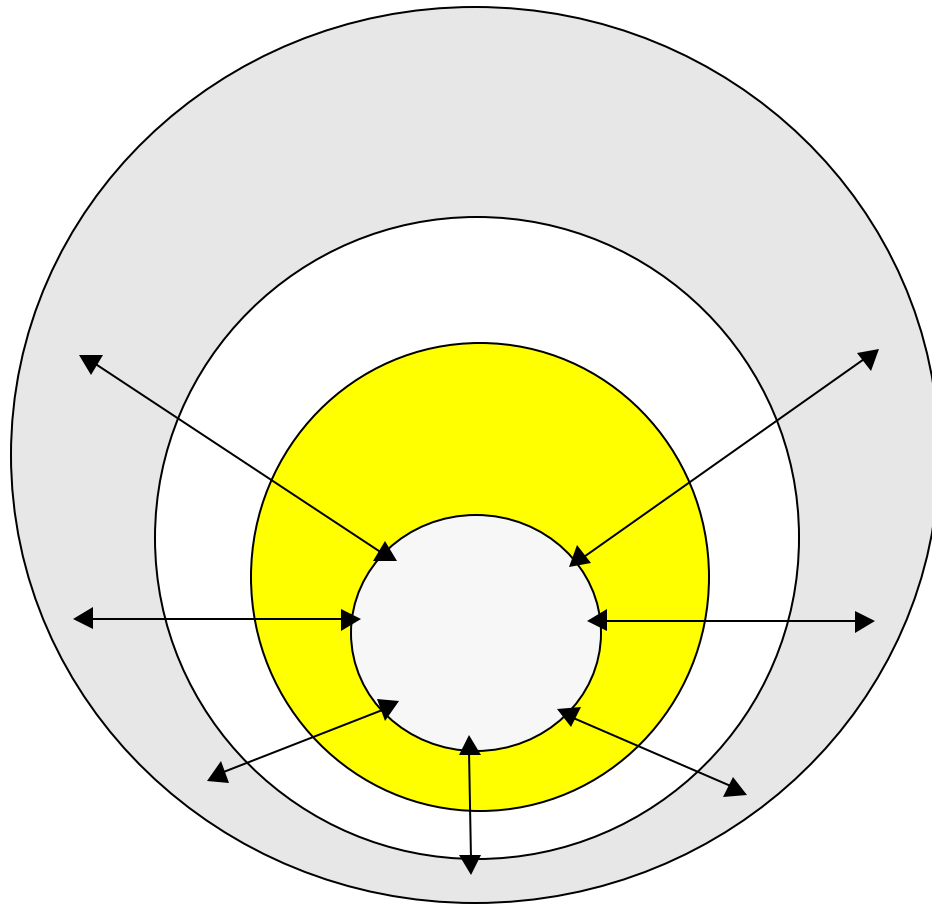


Figure 1. Visualization of Organizational Culture in MOT in Developing Nations.

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