Title: A Critical Review of " The Adoption of Advanced Manufacturing Technologies: Human Resource Management Implications"

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Abstract: A paper titled "The Adoption of Advanced Manufacturing Technologies: Human Resource Management Implications" is critically reviewed in this individual report.

A Critical Review of " The Adoption of Advanced Manufacturing Technologies: Human Resource Management Implications"

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THE ADOPTION OF ADVANCED MANUFACTURING TECHNOLOGIES:HUMAN RESOURCE MANAGEMENT IMPLICTIONS

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Research Paper on "The Adoption of Advanced Manufacturing Technologies: Human Resource Management Implications".

By Donald S. Siegel, David A. Waldman, and William E. Youngdahl

Introduction

The globalozation of the economy and free-trade initiatives such as the North America Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trades (GATT) have encouraged many corporations to ponder the steps needed to become internationally competitive [1]. To that end, many companies are adopting Advanced Manufacturing Technology (AMT). Worldwide competition and the pace of technological innovation will not permit distraction from companies' primary task: producing quality products at competitive prices. Companies adopting new technology need to change its organization as well. New technology involves change in the ways in which products are made- allocation of tasks, machinery, change in work methods may imply retraining, organization of work or number of people [7]. But the purpose of the research is to turn our attention on the effects on people and the strategies followed by Human Resources on the adoption of new technology.

Concepts

The global competition has forced many companies to change and acquisition new technology. This new technology allow them to reduce time to market while meeting customers needs. But it has also brought changes on the area of Human Resources which require the implementation of new policies to meet the technology strategy. These changes occur for several reasons. First, many new technologies allow for the substitution of capital for labor.

Automation and computerization on the factory floor can significantly reduce the demand for low-skilled production and clerical workers. Second, new technologies can dramatically change the work environment because they are integrative and information intensive. Also these innovations may empower workers by providing them with more information about activities in other functional areas. Last, innovation could stimulate an increase in the demand for highly skilled or highly educated workers who may be more adapt at learning the new technology. The purpose of the research made by Donald S. Siegel, David A. Waldman and William E. Youngdahl, was to examine the extent to which the adoption of AMT is associated with two major HR strategies: 1) employee empowerment and 2) recomposition of jobs.

Methodology

The investigation was based on a comprehensive, firm-level survey of AMT usage among Long Island, NY, manufacturers. A potential subject pool was identified by targeting all manufacturing companies in the region with at least 100 employees, as well as 49 smaller manufacturers. This resulted in a total of 403 firms. Given the complex of the survey, they decided to identify a person within the company to complete it. Only 77 companies chose to participate and this survey procedure yielded a response rate of approximately 21%. The key data for this study included: 1) the extent of AMT implementation, 2) the year of AMT implementation, 3) the methods of AMT implementation, and 4) levels of employment for the year 1987-1990 for six types of workers: managerial and supervisory, technical and professional, scientists and engineers (R&D), clerical and administrative, direct (production) labor and supporting personnel, and other production employees (generally, service workers).

Contribution to Research Literature

The contribution of this research paper is very important because we always find the benefits of the new technology but we never see the effects and implications on Human Resources. Sometimes we only see the effects of the adoption of new technology: Downsizing, laid off and changes on the organization structure. This study suggests a favorable connection between AMT and employee empowerment. The relationship may depend on the degree of AMT being considered [8].

The concept of employee empowerment mentioned in this study refers to the ability of workers to assume new responsibilities. Some of the methods utilized are: 1) training, 2) changing employees' job responsibilities, and 3) creating new jobs and career opportunities for employees [8]. These are some of the methods used by Human Resource to minimize the effects of the adoption of new technology. Also the research suggest a positive impact on job enrichment, increased job opportunities and roles, and increased employee control [8].

But the study also shows the other side of the coin. With adoption of high degree of AMT, the result will be different from the mentioned above. The implementation of high automation will not enhance the requisite training, job responsibilities/opportunities, or control on the part of the existing workers. Instead, control will be in the hands of programmed machinery and select group of highly skilled, technical personnel. This coincide with the changes we see on the companies because the U.S. has been moving from assembly-line or physical work to a technical society using more machines on the shop floor and more workers in the office[6].

How does the paper compare with other research publications in the field?

The other papers that I read were focused more on the technical aspect of the adoption of Advanced Manufacturing Technology than in the human factor. That why, I think this research is very important in the contribution to research literature. Other researchers also agree that implementation to the new technology require a change on the organization but fail on mentioning the effects on people. Most of the researchers were focused on the impact of AMTon Productivity and quality and the methods and barriers to effective implementation. But also I found some that stongly support the concepts of this paper. The studies by F. Frank Chen /Everett E. Adam and Charles J. Hollon / George N. Rogol support the concepts on this paper. On their researches, they found that the manufacturing sector has recently witnessed the downsizing and skill upgrading of the workforce, or a substantial increase in the level of education and skill of production and nonproduction workers due to technological change [2],[3].

What are the strengths and weaknesses of the paper ?

Strengths

This work is of great value to the management of technology because its topic. A few articles talk about the effects of new technology on people and society. This is for me a very important topic because people move the machinery. And we need to know how to minimize the negative effects of the new technology. The paper shows very well the changes on the levels of employment due to adoption of new technology.

Also the interpretation of the results were very good explain. Showing that adoption of advanced technology will increase employee empowerment and lead to shift in labor composition in favor of highly educated workers. Also predicted that the compositional changes should be stronger for integrated AMT than for linked AMT, since the former may result in the displacement of low-skilled workers in favor of higher skilled workers[8].

Weaknesses

The paper did not show the Human Resources' strategies to meet the change on technology. Only show the changes on the different levels of workers. Also didn't mention the impact on the society. Also I would like to see a sample of companies around the nation instead focus on only one region.

Conclusion

The empirical results are consistent with these predictions. Using firm-level data, they found that technological change is associated with a shift in labor composition in favor of workers with higher levels of education. These results are consistent with the notion that skill upgrading occurs after new technologies are implemented on the factory floor[8]. Also, recomposition appears to be most strongly associated with integrated AMT as compared to linked AMT.

All this conclusion are well stated on the paper and supported with data and explanation of the results. but it could gain more strengthen if perform a deep study on the human factor and

with a sample of different companies around the nation . This way they avoid problems specific to the region.

Future Work

It would be interesting to study the casual relationship between technological change and HR strategies. Because in this research they did not mention the strategies followed by HR to meet the new technology. Also would be a good opportunity to study the effects of the new technology on the human factor (empowerment and job recomposition).

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There's a lot of lit on AMT and its adoption. You could have used these.