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Analysis of The Influence of Technology, Latest Working Equipment Usage, and Industrial Relations Strategies Towards Business Sustainability

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Abstract

This research aims to contribute to modern business, new work systems, and industrial relations. This research is a longitudinal study involving manufacturing companies. Researchers collected data at two different periods. Researchers surveyed by sending a questionnaire to the company's human resources managers. Research findings show a reasonably strong relationship between implementing new work practices and better company results. However, according to the dominant theory, this result does not always occur in every case. These results indicate a greater focus on small businesses, which play a significant role in the fabric industry. The third result shows the durability or sustainability of individual practices. These new practices have proven effective in improving company performance, which may be why groups are more confident implementing them. Discriminant analysis reveals that firms' structural and market characteristics account for most of the variability in their orientation toward organizational innovation. The intensity of relationships with other companies positively correlates with using new work practices, mainly if the company operates internationally. The competition level in the company's market is also related to the use of new work practices and intense, innovative activities, especially those related to technology and the coordination of activities within the organization, such as information technology.

Keywords: Business, Human Resource, Industrial Relations, Information Technology.

1. Introduction

Work transformation has been a topic of interest to various scholars. Much attention has been paid to what is known as high-performance work practices in international literature. It is a new work practice associated with new production and organizational strategies in the industry, following a paradigm shift from the Taylor-Fordist approach. It is a set of practices aimed at increasing employee commitment to the organization [1]. These practices deviate from the old paradigm of managing company labor relations, especially in three main dimensions: how work is organized, coordinated, and managed. Despite its unclear definition, companies view it as a crucial element of their high-competitiveness strategy. These practices differ from those associated with lower strategies, focusing more on controlling costs through a flexible workforce. This work transformation responds to demands to increase productivity, quality, and organizational flexibility in an increasingly complex and changing business environment. As such, it plays a vital role in creating a work environment that supports innovation and the company's long-term growth.

Its practices are usually considered one of the main components of the so-called high path to corporate competitiveness. These practices differ from those that characterize low strategy, which centers almost exclusively on controlling costs through a flexible workforce [3]. The high road to corporate competitiveness involves investment in human capital, skills development, quality improvement, and increased productivity. Its practices can cover various aspects, such as worker participation in decision-making, employee training and development, performance-based incentive systems, and recognition of individual contributions [4]. By implementing these practices, companies can create a work environment that allows workers to bring the best of themselves, increasing their commitment to the company and, in turn, improving the company's overall performance. This differs from approaches focused on cost control, where the primary emphasis is reducing production costs through strategies such as workforce cuts or using more flexible contract labor [5].

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Changes in the organization of employment relations have also received significant attention, particularly in many developed countries. The changing characteristics of the socioeconomic context in which companies and unions operate now pose challenges to collective bargaining methods, once considered the most efficient regulatory methods in Fordist times [6]. Currently, the collective bargaining method no longer has the dominance it had in previous decades. There are more heterogeneous positions in terms of the direction of change. Some argue that this change has occurred since the eighties. These challenges in managing employment relations cover various aspects, such as increasing flexibility in the labor market, technological changes, economic globalization, and consumer demands. This prompts companies and unions to re-evaluate how they work together to manage labor relations [7]. However, it is essential to remember that although collective bargaining methods may no longer be dominant, this does not mean that collective bargaining is no longer relevant or practical. Many companies and unions still see the value in collaborating to reach agreements that benefit both parties. Socioeconomic changes have only encouraged the adoption of more flexible and innovative approaches to organizing employment relationships [8].

There is a general tendency on the part of companies to encourage a return to the unilateral management methods that dominated in the pre-Fordist period. On the other hand, some argue that post-Fordist companies should actively seek the cooperation of their workers rather than relying solely on achieving a compromise between still different and conflicting interests, as is the case with collective bargaining methods [9]. In the first case, the change in direction represents a return to unilateral actions guided by management. In the second case, participatory methods such as consultations, joint committees, or legally established codes bolster worker participation, particularly in workplaces where trade unions are strong and entrenched [10]. At the macro level, the legal system and public policy are tools to accompany or counter the tendency to return to unilateral methods of action, depending on the color of government. At the second level, the social partnership becomes a policy-making modality in which social partners are continuously involved under public actors' more or less hidden direction but without reaching any absolute social agreement or pact [11].

Interestingly, the schematic representation of these two approaches is that in both cases, the direction of change goes out of the realm of negotiated action towards unilateral action in one case and towards cooperative action in the other. The direction of change remains a matter of negotiation. Previous researchers highlight that collective bargaining methods will lose some effectiveness because they only benefit individual or small-group negotiations and are only part of the tripartite social agreement [12]. This tends to trigger a process of decollectivization in talks. More workers with high market power drive this process, leading them to abandon collective action rather than managerial pressure, urging a return to unilateral action. Thus, changes in employment bargaining methods remain within negotiations but increasingly lead to negotiations by individuals or small groups rather than as part of a collective process involving the entire trade union. This reflects the complex dynamics of modern industrial relations, where the market power of individual and worker groups increasingly influences workplace negotiation processes [13].

More generally, interested parties are very concerned about changes in labor regulations at the company level, especially those related to the continuity of the traditional industrial relations system, which is based on relationships between collective actors. This aligns with adopting a human resources management strategy based on individualizing the relationship between employers and employees. The high-performance work practices approach is seen as a position in the middle between these two extremes [14]. The characteristic that differentiates its supporters from human resource management supporters is their pro-union rather than anti-union stance. Some authors describe the co-presence of human resource management and traditional industrial relations systems in companies as new realism. According to the dominant theory, new work practices aim to achieve or maintain a high level of competitiveness by increasing employee commitment to the company. If implemented well, these practices can improve the well-being of both workers, especially in terms of economics and motivation, and companies' economic performance, work productivity, and product quality [15].

Modernization of the business world is a limited phenomenon that, in many cases, cannot demonstrate the incompatibility of the old paradigm with the changing competitive context. Although the degree and spread of change in industrial systems vary, it based entrepreneurial strategies demonstrate fundamental differences compared with the traditional Taylor-Fordist organizational model [14]. These differences can be summarized in a clear shift from the concept of workers as mere factors of production towards an assessment of the contribution they can make with their knowledge, skills, and experience. In this context, increasing employee commitment to the organization is considered an additional element capable of providing a competitive advantage for the company in the market. However, discussing it without explicitly defining the new practices and their quantity can confuse [15]. The literature has no universal definition of which practices fall under it. Each author uses a different definition, so comparing the results achieved is impossible. Therefore, before proceeding to a review of the existing empirical literature, an analysis of the evolution of the terminology used in the literature will be carried out, and some methodological obstacles faced in dealing with the topic will be highlighted [16]. Then, a definition of high-performance work systems will be provided that can serve both as a reference for this research and as a systematization of existing work systems, thus becoming a valuable tool for those who wish to overcome this phenomenon.

2. Research Methods

This research is a longitudinal study involving manufacturing companies. Data was collected at two different periods. The survey was conducted using a written questionnaire sent to the company's human resources managers. Conducted two rounds of telephone reminders to increase response rates, resulting in a 50% increase in initial responses. In the context of methodology, the most common recognition method followed by companies is autonomous management by the company, especially in practices that are difficult to implement. For example, in the case of decentralized decision-making, unilateral management by the company occurs in 80% of cases. This shows that companies ultimately control their decisions without involving external parties.

3. Results and Discussion

Trends analysis showed that most of the sample experienced increased use of new practices. However, this evidence fails to consider the number of companies that fall into innovative or traditional categories. The fact that some companies are implementing new practices does not necessarily imply a high level of use. Similarly, other companies may have reduced the intensity of use but still maintained high adoption rates. Companies classified as stable can also have very high or negligible adoption rates. Setting aside trends over time and focusing on the actual use of practices, companies are classified as innovative if they use at least three of the six detected practices to a reasonable or significant level and as traditional if their use is lower than this threshold. The percentage of innovative companies increases as company size increases. This result contradicts previously observed, namely, more innovation in small-scale companies. The expansion trend in recent years has been more vital for small businesses, but adoption rates remain higher for large corporations. We can interpret these results as a sign that small production companies have realized the potential associated with HPWP and are now trying to recover lost ground in recent years.

Further analysis shows that over half of the sample uses modern organizational practices. However, when probed deeper, only 8% of companies implement all six practices, at least to a moderate level. There is no relevant indication when considering companies' distribution by sector. We find an even distribution between traditional and innovative businesses at the aggregate level, and this distribution also holds when analyzing the individual sectors in which the companies operate. However, in the case of food and textiles, the reported percentages cannot be considered significant due to the minimal number of reference samples. The apparent exception is the chemical sector, where many companies are innovative. This confirms that this sector is one of the most advanced regarding work organization and relations between parties. Despite a clear expansion phase and a significant number of companies using HPWP, the scope of these new practices remains limited. Rather than system users, it is better to talk about transition users. However, suppose the positive impact of new practices on firm outcomes increases as the intensity and number of practices introduced increase. Why is there a significant increase in the spread of such practices that are not accompanied by greater intensity in their use?

The intensity of a company's relationship with other companies is the factor that has the most significant differentiating weight. This means that the more innovative companies are, the more contacts they have with other companies. Furthermore, we find information and communication technology (ICT) innovations related to methods of coordinating activities in organizations based on importance. All variables associated with introducing technological innovations in organizations have a particular significance but, for obvious reasons, are correlated. Therefore, we confirm that the presence and intensity of technological innovation processes in companies are complementary to the modernization of work systems. The third differentiating factor is the competitiveness of the company's market; on average, innovative companies operate in more competitive markets and compete in more international markets than traditional ones. Finally, the two variables with the most negligible discrimination weight are the presence of a trade union body for worker representation in the company and the level of trade unionism. This last variable, which was not significant in the initial test of equality of means, has a negative coefficient. Although union representation has a positive role in introducing new practices, the level of unionization has a negative influence. Upon initial examination, the two results may appear contradictory; however, it's essential to acknowledge that this sample predominantly comprises small-sized firms, which typically have a lower prevalence of traditional industrial relations institutions. In conclusion to this descriptive part of the results achieved, it is worth remembering that some variables excluded from the final discriminant function remain significant in differentiating the two groups of businesses. This occurs, for example, in the percentage of graduates in the total number of employees, in the size of the company, and in all variables related to the technological innovations introduced in the company, among which, as we will see shortly, the percentage of staff involved in these innovations is an exciting element.

The previously presented results corroborate this research: the structural and market characteristics of each firm, at least in part, cause variations in firms' attitudes toward HPWP in the same institutional context. Therefore, the identified models cannot explain part of the variability in firm behavior. The reasons for this must be sought in terms of the various factors, often not directly measurable, that typically influence entrepreneurial strategy and some of the possible measurement errors that characterize this survey. Among these factors, the company's health must undoubtedly be considered. In some cases, it is unlikely that a company in a critical economic condition will decide to spend the little energy it has available to invest in implementing new practices or technologies. As already mentioned, HPWPs require enormous efforts (not only economic) and a considerable amount of time before they can impact company results, so the need to be accountable to investors in the short term can be an obstacle to implementing HPWPs. Issues relating to the profitability of organizational innovation are also more pronounced for companies in uncertain economic situations. Furthermore, using HPWP as a way out of the corporate economic crisis is the riskiest method because it requires an intensification of workers' efforts, which in turn is a strategy that is unlikely to produce good results in the long term.

Unfortunately, this survey does not collect information regarding business market performance; instead, it considers the instability and uncertainty that have characterized the economy in recent years. An important role can be attributed to this factor in determining the failure of companies to adopt new work practices that are still based on traditional models. Another factor not considered, which can potentially influence a company's orientation, is the type of goods produced. Although the analysis shows that the sector they are involved in is not an essential element in differentiating innovative companies from traditional companies, the characteristics of the final product can be very different even within the same sector and undoubtedly influence the production process and work organization. At this point, a broad and vital debate will open regarding what production models are associated with HPWP diffusion, but there is no interest here in discussing its merits. At a high level of abstraction, we can argue that companies competing on quality rather than cost are more likely to adopt new work practices. The recent results partially confirm this, highlighting the growing number of technological innovation processes in companies modernizing their work organizations.

Variables relating to the non-financial costs of transitioning to new practices are those most susceptible to the risk of measurement error. The main reason lies in the difficulty of identifying appropriate indicators. The intangible nature of these costs may prevent the choice of indicators and measurement scales from achieving the goal of proper representation. The year of the company's founding (or the change in ownership structure) may not be a suitable indicator in this analysis, as the workplace's corporate culture does not necessarily correlate with the company's age. However, this indicator provides a significant result: if it is true that HPWP is more straightforward to implement in newer corporate fields, the business climate that characterizes brownfields may not necessarily resist innovation in work systems but may be a facilitator that acts as a driving force for the introduction of the practice. -new practices. Seniority in the workplace does not indicate the relevant level of modernization of the work system; this is relevant evidence, contrary to the theory that dominates the current debate.

The exact limits also apply to the average seniority of a company's employees. Furthermore, in this case, an objection to the methodology used may be the use of aggregate indicators relating to all employees without considering differences in qualifications. As we have said, it has been proven that some qualifications are more capable of inhibiting than others. Even considering the average seniority for each qualification, the indicator remains statistically insignificant. A more reliable indicator may be a combination of company age and seniority. However, we cannot reject the hypothesis regarding the influence of non-financial transition costs on new practices; we identified the number of graduates as an essential variable in differentiating companies' approaches to new practices despite its exclusion from the final discriminant function. This leads us to believe that transition costs still have some explanatory power, at least regarding the quality of organizational resources available, and act as a stimulus to search for indicators capable of better capturing the phenomenon.

Another hypothesis related to the possibility of measurement error is the hypothesis associated with the presence of non-standard workers in the total number of employees. The fact that non-standard workers are considered contract workers in addition to full-time and permanent workers may not be the best way to test the validity of the core-periphery model. Some contract forms that approximate full-time and permanent employment may involve workers holding core company functions and being involved in implementing new practices, whereas peripheral worker characteristics are more likely to be found in contract forms that are far from the typical model. However, even in this case, the results of sorting by contract type do not change. As stated in other studies, the presence of non-standard workers does not indicate the existence of HPWP, and hypothesis 4 must be rejected. These results reinforce other evidence already mentioned, which shows how numerical and functional flexibility strategies are pursued by companies in a completely independent way, without any significant relationship between them. The other three hypotheses are all accepted in their different declinations, and each offers ideas for further analytical reflection. Hypothesis 3 proved the strongest: the index variable for measuring the intensity of relationships with other companies is the variable that has the most excellent discriminatory weight, and the level of competition in the reference market occupies the third position in the hierarchical classification of variables. These two variables can be included under the label competitive context, being two indicators of the company's competitive strategy characteristics in the first case and the reference market in the second case.

The importance of relationships with other firms should not be surprising given that the production structure consists mainly of medium and small firms that follow a production strategy based on so-called flexible specialization. Companies that follow this strategy are distinguished by their highly innovative characteristics and operating methods, often involving collaboration within networks or districts. Therefore, we can interpret the stronger relationships among companies that consistently use HPWP due to the unique characteristics of this industry sector. Once the index variable is constructed, i.e., by attributing the highest scores to those firms that have the most contact with foreign firms and compete in international markets, the importance of relations with other firms can also be used to explain the delay in HPWP adoption due to the internationalization tendencies of these countries' firms. This interpretation posits that companies often introduce innovations in work organization systems through imitation or adaptation, a process known in organizational theory as organizational isomorphism.

It can also exclude the possibility of technological innovations aimed at greater task standardization, worker specialization, and work process fragmentation. This interpretation is supported by the importance of the education level in the workforce we mentioned earlier. The presence of HPWP, high investment in innovation, and high intensity of graduate personnel are three factors that, when combined, can undoubtedly be considered good indicators of innovation, both from the perspective of work quality and product quality. Finally, exciting results also emerged regarding the characteristics of industrial relations in companies. The results, which show a positive relationship between the use of HPWP and the presence of formal union representation, strengthen HPWP advocates' positions and confirm the differences between this approach and a pure HRM approach. However, it also appears that there is a negative relationship between new practices and levels of unionization. Therefore, HPWP is more widely applied in workplaces with union representation, whereas in workplaces where workers have many unions but are not well organized, this does not apply.

We can hypothesize other possible explanations for these results, but given the characteristics of the sample, primarily small and medium-sized companies, this interpretation appears to be the most valid. For instance, we can interpret the achieved results by imagining various trade union strategies in companies, each based on their bargaining power. Therefore, the approach of weaker unions will be characterized by a search for legitimacy through collaboration with management, while representatives of more vital unions who have been widely recognized by the opposing side will choose to continue to focus on distributive bargaining, which will hinder innovative management. Here, too, the sectoral composition of the sample is essential, although to a lesser extent. The trade union movement's radical component is powerful in the metalworking sector, representing about half of the sample. It is possible that this component, which still largely bases its strategy on the conflict between the various interests in the workplace, determines the results shown.

A further explanation, which is opposite (and perhaps complementary) to the previous two, may lie in employers' fear of losing their freedom of action by introducing the HPWP in the face of potent trade unions. A recent study shows that the presence of trade unions with considerable authority guarantees that the organizational innovations introduced are substantial and not purely formal. Although this interpretation presupposes a pessimistic vision of managerial initiative (formal or consultative practices are preferable to substantial or delegation practices), some of these results may be due to the fears of entrepreneurs when they are in a highly changing organizational context, with the possibility of less control over workers and the power of trade unions unchanged (if not strengthened). In addition, managers will probably prefer to introduce innovations progressively, moving away from consultative practices and then towards truly participatory practices (i.e., delegation of decision-making).

4. Conclusion

Social and political debates primarily discuss employment transformation in our country, focusing on the need for companies to adapt to new dimensions and the consequences of individual employment instability. The qualitative aspects of these changes have so far attracted less attention. However, if implemented well, we face a transformation that can enrich job content, increase worker satisfaction, and provide better economic and productive results for companies. The reviewed research indicates a strong correlation between adopting new work practices and improved company outcomes. In particular, the positive impact concerns economic and productive aspects and is also related to the quality of output and behavior of working people, such as reducing absenteeism. However, according to the dominant theory, this result does not always occur in every case. Most argue that new work practices must be introduced intensely and coherently in packages to be effective for companies. Trying to find a synthetic formulation of the three theses discussed in the second chapter, it could be said that, to have a positive and significant impact on company performance, it must be introduced so that practices regarding work organization and coordination methods are consistent with each other, supported by adequate personnel management practices. , and designed consistently with managerial capabilities, market strategy, and the institutional context in which the company operates.

In ten years of observation, small companies increased their use of new work practices the most, indicating a relatively new awareness among small businesses of the competitive advantages associated with new work systems. Although the most significant increase occurred in large companies, it is only in the last decade that small companies have begun to become interested in these innovations and are trying to catch up with the lag accumulated in previous years. These results indicate a greater focus on small businesses, which play a significant role in the fabric industry. The third result shows the durability or sustainability of individual practices. Practices that are hard to introduce are also challenging to maintain over time. This could be a stimulus to investigate organizational use of innovation not only at a systemic level but also by examining individual use of new practices and following their success over the long term to understand individual potential and critical issues, not only in relation to other people. Finally, we can answer why groups are more confident in companies' use of technology by observing the latest technology's positive impact on company performance, which grows as the amount and intensity of the practice increases. This suggests that these new practices have proven effective in improving company performance, which may be why groups are more confident in implementing them.

Discriminant analysis reveals that firms' structural and market characteristics account for most of the variability in their orientation toward organizational innovation. However, the question of profitability can be an additional explanation that complements existing explanations, especially for companies that are not very large in size, are in a critical economic situation, or compete on price rather than product quality. Some companies may rationally reject new practices, mainly if cultural reasons or ignorance also affect their decisions. Returning to the characteristics of innovative companies, this analysis supports many existing theories. The intensity of relationships with other companies positively correlates with using new work practices, mainly if the company operates internationally. The competition level in the company's market is also related to the use of new work practices and intense, innovative activities, especially those related to technology and the coordination of activities within the organization, such as information technology.

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