

The impact of technological development on employee controllability

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ABSTRACT

The impact of employee controllability is analyzed in this paper under the premise of technological development as a background. Using employee stress as a mediating variable, the conclusions are made more convincing by both citing the literature and analyzing the survey data. After conducting a series of analyses, it was concluded that employee stress affects employee controllability while being influenced by technological developments. The analysis of primary data then leads to the conclusion that employee stress is significantly and negatively affected by technological developments. Also, combining this finding with the discovery in this paper that employee stress negatively affects employee controllability, this paper thus allows for the conclusion that technology development negatively and significantly affects employee controllability.

KEYWORDS

Technological development; Employee controllability; Employee stress

1 Introduction

1.1 Overview

In an era of rapid technological development, interpersonal relationships have become more delicate, including the relationship between employees and employers. Employee controllability symbolizes the employee-employer relationship, which could be defined as the degree to how the company can control the actions of its employees. When employees are easily controlled, there is less conflict between them and their employers, which means more harmonious cooperation and more efficient work. At the same time, a high degree of controllability avoids frequent employee changes, which means lower human capital consumption for the company. Therefore, it is worthwhile to study the factors that affect employee controllability to bring better solutions to companies for more stable growth. As what is mentioned by Cheng J & Bai H, it is essential for companies to capture the most critical elements within their control to improve employee attitudes within the context of available resources [1]. At the same time, as what is found in the research of Chiarini, A., Belvedere, V., & Grando, A., some strategies can be broken and achieved through the development of technology, which means technology plays a more important role in business [2]. In this paper, new technologies resulting from the development will be mentioned and it will be judged whether it is one of the factors affecting the controllability of the employees.

1.2 The reality of the research on the influence of technological development on

employee controllability

The relationship between employee and employer is gradually evolving in an uncontrollable way with the constant updating of technology. In a portion of jobs, the importance of work experience has been replaced by the convenience of new technology. Workers with high levels of experience no longer represent authority, and the experience gained over time is at a disadvantage when compared to new technology. All this means that compared to the past, the new generation of young workers is losing their sense of awe of their predecessors and replacing them with an increasing degree of autonomy. More and more employees make it difficult for their supervisors to manage, and this leads to a higher turnover rate, which means more loss of human capital for the company.

And for companies, low employee controllability can lead to more than just a loss of human capital. Both the constant movement of personnel positions and the process of onboarding and offboarding and recruiting can create higher instability in payroll and a costly drain on the economy. At the same time, it is difficult for leaders to make appropriate decisions when there is instability within the company. In addition, more skepticism can make it more difficult to implement decisions, which is detrimental to the overall company operations. Therefore, it is worth to study this impact and find solutions to it.

2 Literature review

According to Beer, P., & Mulder, R.H., technology could be seen as a tool which is changing how employees and organizations accomplish works [3]. As what is discovered by Eigaard, O.R., et al., the conclusion that new technologies can successfully improve the efficiency of the industry can be confirmed after researches [4]. However, in some aspects, under the trend of automation and robotization of work, the complexity of work will increase, accompanied by more mental work. At the same time, employees need more input in decision making to gain the ability to handle more difficult tasks, accompanied by a quest for autonomy and complexity, which puts more pressure and responsibility on employees in their professional work status. In Beer's study, the concept of autonomy is clearly articulated through the analysis of various psychological theories of motivation and stress, with illustrating the factors of the challenges and rewards that affect employees. Under a systematic analysis, this is worth being referring to. However, when examining the meaning of autonomy, the model used is from 1975, considering that technological development is a process of epochal nature, the evidence supporting the theory would appear to be weak, this leads to compromised accuracy of the conclusions. Therefore, in this paper, all the data used are the most recent data obtained by means of a questionnaire to improve the real-time nature of the study.

In addition, the existing literature has also examined the relationship between technological development and employee performance. As what is mentioned by Abbas, J., investment in technology is a key factor for organizations to grow and gain priority over the competition, and it is necessary for organizations to use technology across the board to improve efficiency and productivity [5]. As the most important resource of a company, employees are considered to need the help of technology from the organization because it makes it easier for them to do their jobs. In the study of Abbas, through case studies and theoretical analysis, it was concluded that the investment of a company in new technology positively affects employee performance. In this study, technology was found to significantly increase employee productivity, which means saving time while also reducing the workload of the employees themselves. In addition, tasks performed through the new technology will receive a higher accuracy rate, accompanied by fraud avoidance. Abbas has invested a great deal of effort in studying how employees can properly use new

technologies with maximum efficiency. But he may have overlooked the problems that could be caused to the company if employees were able to easily improve their performance. For some new employees, the ease with which they can do their job through the use of technology can make them more arrogant, which can be a factor in loyalty, and for a company, an employee who lacks humility can be difficult to manage. For some new employees, the ease with which they can do their job through the use of technology can make them more arrogant, which can be a factor in loyalty, and for a company, an employee who lacks humility can be difficult to manage. In the process of reducing the importance of work experience, companies are likely to be challenged by the degree of employee controllability. So, it is worth being studied from another perspective. The Abbas study, which is representative of much of the literature in this area, devotes sufficient effort to the efficiency of use of employees of new technologies, but it is only one aspect of the relationship between employees and technological development. In this paper, more aspects will be discussed in order to pursue comprehensiveness.

3 Practical theoretical analysis of the correlation between technological development and employee controllability

3.1 Hypotheses

In order to explore deeply the extent of the effect of this influence, it is appropriate and beneficial to make some assumptions. This study will present three hypotheses, the third of which will be studied from the perspective of data analysis, while the data studied were all obtained from a questionnaire created specifically for this study, from full-time workers aged 18-50. At the same time, the purpose of the first and second hypotheses is to justify the third hypothesis from another perspective, through the perspective of theoretical analysis, leading to more credible conclusions. In order to get the desired results of the study, the two main variables mentioned in the hypothesis were set as new technology and employee controllability, considering that employee stress may be considered to be linked to both of them, it is also worth to be set as one of the variables. However, whether these variables are indeed related to each other will be verified later in this paper. In order to analyze through logical content, the possibility of employee stress is proposed as a mediating variable in the second hypothesis, so as to derive the relationship between new technology and employee controllability.

In Hypothesis 1, in order to complete a more comprehensive analysis of the hypothesis, the development of new technology is generally set as the dependent variable and the accompanying employee stress is considered as the independent variable. Meanwhile, hypothesis II responds to the link between employee stress and employee controllability, where employee controllability is considered as the dependent variable while employee stress is the independent variable. Furthermore, among the final hypotheses, the development of technology is once again the dependent variable, while employee controllability is defined as the independent variable, and this hypothesis represents the final result of the entire study.

H1: The diffusion of new technologies will cause an increase in employee stress

H2: Employee stress mediates the effect of new technologies on employee controllability

H3(Final Result): Technology development has a significant negative impact on employee controllability

Table 1 Dependent and independent variables in the research

	Dependent variable	Independent variable
H1	Technology development	Employee stress
H2	Employee controllability	Employee stress
H3 (Final)	Technology development	Employee controllability

3.2 Analysis

In testing the first hypothesis, it is reasonable to first consider the changes represented by the diffusion of new technologies. According to Beer and Mulder, with technology being widely available, an increase in workload and workflow disruption is seen as inevitable [3]. As a result of the higher workload, the role expectations of the company for employees have changed at the same time. According to the traditional role division, employees were more responsible for getting the job done. But after the rapid development of technology, the responsibilities that employees and technology need to take on for each other have changed significantly. With pressures such as sustainability, employees are being asked to master a higher workload that they can handle effectively, while increasing their flexibility and autonomy. In addition, in the theoretical analysis part of the study, Beer found that technology has been able to easily replace some routine tasks in the workplace. As routine tasks being generally systematized as well as process-oriented by following a series of rules, and this is one of the roles of automated processes. The characteristics of the machine that can work in an assembly line is a perfect match for the majority of jobs [3]. This leads to more attention being paid to tasks that require flexibility as well as creativity that can only be performed by real people. Against the backdrop of machines that can perform tasks efficiently, employees must operate these machines with care, because a mistake can also mean greater losses than before at the same time, which makes the psychological pressure that employees receive even greater. Through the development of technology, original tasks of employees are easily and more efficiently performed by machines, and the contrast brought about by this replacement can reduce confidence of employees and enthusiasm for their work. With all these psychologies at work at the same time, the psychological stress of employees is amplified by the rapidly evolving technology.

In order to investigate whether the second hypothesis holds, the actual direction of the research is how employee controllability will affect employee controllability. According to Lahti, H., & Kalakoski, V., employees who feel they are stressed feel that the stressor is beyond their control, and this uncontrollability leads to higher stress levels [6]. This is similar for leaders and employers, where the high pressure on employees makes them more uncontrollable. It is not feasible to try to reduce the impact of work stress on an individual level alone. And what big stress affects is the psychological resources of employees, which will mean that they are more likely to be resistant to work. For company operations, when employees have strong resistance, it is difficult to get work done efficiently and the growth of company might be difficult. In addition, employee dissatisfaction can be seen as a sign of diminished employee loyalty, making it a difficult and inefficient option for organizations to control an employee who is not loyal. Therefore, stress can be considered as a factor that is negatively correlated with employee controllability. According to what was mentioned before in this paper, the diffusion of new technologies can be considered to cause an increase in employee stress, so employee stress can be considered as a mediating variable in the study of the link between new technologies and employee controllability, which represents the validity of the second hypothesis.

To verify the correctness of the final hypothesis, it is reasonable to consider stress, enthusiasm, and attitude as specific manifestations of employee stress. Thus, a questionnaire was designed and targeted full-time working adults between the ages of 18-55 in order to obtain data sufficient to

support the study. Furthermore, SPSS was used to calculate the relationship between these three indicators and the impact of technological development.

Table 2 Correlations between advanced technology impacts, stress, enthusiasm, attitude to each other

		Advanced technology impacts	Stress	Enthusiasm	Attitude
Advanced technology impacts	Pearson Correlation	1	.637**	.617**	.650**
	Sig.(2-tailed)		.000	.000	.000
	N	208	208	208	208
Stress	Pearson Correlation	.637**	1	.611**	.600**
	Sig.(2-tailed)	.000		.000	.000
	N	208	208	208	208
Enthusiasm	Pearson Correlation	.617**	.611**	1	.636**
	Sig.(2-tailed)	.000	.000		.000
	N	208	208	208	208
Attitude	Pearson Correlation	.650**	.600**	.636**	1
	Sig.(2-tailed)	.000	.000	.000	
	N	208	208	208	208

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

After the reliability validity test, the data in the table were considered to be credible. As what is illustrated in the figure, the Pearson correlation coefficients between technological development and stress, enthusiasm, and attitude were 0.637, 0.617, and 0.65, respectively. In the case of being positive, higher Pearson coefficients imply higher correlations, so when the Pearson coefficients between all three items and technological development are observed to be close to 0.7, the conclusion that there is a relatively strong link between each of the three items and technological development can be proved. In summary, there is a positive correlation between technological development and the stress, enthusiasm and attitude of employees. Also, a sig value which is 0.000 and less than 0.05 can prove that their association is highly significant. However, according to the findings mentioned earlier in the paper, more stress leads to less controllability of employees, which implies a negative relationship. Overall, as all of the relationships have been illustrated, the relationship between technological development and employee controllability can be seen as having a significant negative correlation, which means the establishment of hypothesis three.

4 Conclusion

In summary, all the three hypotheses proposed in this paper are confirmed. The first two hypotheses are interrelated, and by means of theoretical analysis, the conclusion that technological development affects the controllability of employees is drawn. However, the theoretical derivation of the first two hypotheses alone can only determine that technological development affects employee controllability unilaterally, but not whether they affect each other, and the conclusions drawn are not sufficiently convincing because of the limited number of available references. Therefore, in the testing of the third hypothesis, the method of data analysis was used and the data were all from full-time workers. Through the analysis of the data collected in the latest published questionnaire, the conclusion that technology development and employee controllability have a significant positive impact on each other can be presented. Since the trend of technological development is inevitable, in order to pursue stability within the organization, more effort needs to be invested in employee controllability and to improve employee controllability in other ways to

offset the negative effects of technological development. In the survey, more than half of the employees believe that advance technology training will effectively reduce their stress levels, which is a worthwhile solution for organizations to consider because reducing stress will avoid the decrease in employee controllability caused by stress.

About the author

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