MEASURING THE LEVEL OF AUTOMATION AND ITS IMPACT ON ORGANIZATIONAL PERFORMANCE AND EMPLOYEES' JOB PERFORMANCE

Muhub Ullah Abbasi[1]*, Syed Abdul Sattar Shah[2] and Farhan Zeb Khaskhelly[3]

ABSTRACT

The purpose of this research is to propose the methodology for the measurement of levels of automation with the help of a dynamo reference scale for dynamic levels of automation and to find its relationship with organizational performance, and employee job performance while bifurcating the tasks performed by human and machine. The present research employs quantitative analysis to find out the hypothetical relationship between levels of automation, organizational performance, and employee job performance. The data was collected from managers and employees working directly with machinery involved in production, particularly the Kotri textile mill. The hypotheses testing suggests that the proposed model achieved an acceptable fit with the data (i.e., out of 7 hypotheses, 6 hypotheses were significantly accepted). The study has limitations in generalization, in terms of the survey questionnaire, and the targeted audience (employees of the firms & managers of the concerned department) of textile mills of the Kotri industrial zone. This is the first research that contributes to the methodology in business studies for measuring levels of automation by employing a dynamo reference scale for levels of automation from industrial engineering which is a new concept in business studies. Secondly, this research provides insight into how organizations are performing at optimal levels with the help of machinery with only a minimal number of employees. Finally, future research strongly suggests implementing the methodology for measurement of automation coupled with business research methods in other industries to understand their level of automation and task performance by employees and machinery as this may bring about interesting possible outcomes.

Keywords: *Levels of Automation; Dynamo Reference Scale; Importance-Performance Map Analysis (IPMA); Organizational Performance; Employees Job Performance.*

[1] PhD Scholar, IBA, University of Sindh, Jamshoro, Sindh, Pakistan. Email: muhubullah@gmail.com
[2] Professor and Pro Vice-Chancellor, University of Sindh, Jamshoro, Sindh, Pakistan. Email: pvc@usindh.edu.pk
[3] Assistant Professor, IBA, University of Sindh, Jamshoro, Sindh, Pakistan. Email: farhanzeb@usindh.edu.pk
**Corresponding Author*

INTRODUCTION

In this age of technology, most organizations are adopting advanced manufacturing machinery which are equipped with programmable systems of programmable machines that can manufacture flexibly and with minimal direct human efforts for several products or parts (Dimnik & Johnston, 1993). These may include several types of advanced machinery, including not only computer-aided production processes but also computer-aided AI-enabled design and engineering, production resource planning, and AI-aided process planning (Parthasarathy & Sethi, 2004). Our research focuses mainly on advanced production technology that impacts production operational performance in textile mills such as blower machines, spinning, and carding processes. Automated manufacturing includes a system of humans, Advanced production technology machines, and tools that plan and control the manufacturing process (Zammuto & O'Connor, 2000).

This doctoral research mainly focuses only on measuring the machine's levels of automation used in the textile mill production process with the help of a dynamo reference scale (Parasuraman et al., 2007; Frohm et al., 2007) and addresses what level of automation these companies are working with and how does it affect three organizational performance dynamics, manufacturing performance, labor management, and workers well-being finally employees job performance.

Background of the Study

The use of machinery in production is not a new concept. The Industrial Revolution began because machinery started working with human beings, although at that time machines were not advanced and were not sophisticated or advanced enough to work automatically (Winroth et al., 2007). As technology revolutionized very fast in past decades manufacturing processes have been ultra in dramatic ways most organizations nowadays want to invest a major portion of their profits in technology and innovation projects to employ advanced manufacturing processes to keep pace with growing competition and to boost organizational performance and employees job performance (Winroth, 2007). At the beginning of the industrial era, the main research concern was how to motivate employees and who to keep continuously motivated to get maximum output because at that time it was only humans who could make a difference in production, not machines (Greenwood, 1996). But as machine technology grew and computer technology advanced that advancement came into the manufacturing process, and the focus from employees' motivation diverted to the machine production process. Most of the developed

organizations were looking for more complex machines to implement to achieve higher productivity with less number of employees with higher efficiency at a lower cost of production and that worked perfectly for the organization because it was quite difficult for organizations to keep employees motivated and invest on their training and development and to retain them for a longer period, those all problems were resolved with mechanization (Parry & Barrista, 2023). Then it comes to the advanced manufacturing production control systems. The automated system AI-enabled machines that work automatically and autonomously, unman. Although previous machines ruled over industries for decades the concept of advanced computer machines with AI-enabled technology was introduced that wiped out all old machines and their use (Makridakis, 2017).

Therefore, every organization at present wants to implement advanced machines to increase productivity and competitiveness to maximize their profits. In that regard, business research studies were conducted mainly on organizational performance and employees' job performance when both men and machines were performing equally, and it was to determine with research which part of the organization needs change to achieve maximum profit but in today's organizations where only automated machines are working which only requires supervision from human while eliminating human efforts and skills. It is important for business research to develop a method to measure the levels of automation at what LoA organization is working with and how much human effort is needed to achieve organizational goals and objectives. Because nowadays it's not man it's machine which makes all the difference.

Problem Statement

It is found that there is an effect of automation on the job performance of employees and organizational performance, like The Effect of Automation and Workload on Staff Productivity in under Developing Country in Guinea (Camara et al., 2019). Impact of Business Process Automation on Employees' Efficiency (Ahmad Sirohey et al., 2012). Impact of Information Technology on Organizational Performance: An Analysis of Quantitative Performance Indicators of Pakistan's Banking and Manufacturing Companies (Shaukat & Zafarullah, 2009). Automation and organizational performance: The case of electronics manufacturing firms in Singapore (Wong & Ngin, 1997).

However, preceding studies on this subject have invariably employed the Likert scale and other qualitative methods such as interviews; as a means of determining levels of

automation. This study, apart from exploring the relationship between automation and organizational performance three dynamic operational performance, labor management, workers' well-being, and employees' job performance from a localized perspective concerning Kotri textile mills of the industrial zone, shall also employ the Dynamo reference scale for dynamic levels of automation as a concrete and objective method of gauging levels of automation (Parsuraman, 2007). This scale was developed in 2007 as a dynamo methodology for measuring the level of automation which also helps researchers and organizations to bifurcate several tasks performed by employees and machinery like the Effect of cognitive automation in a material handling system on manufacturing flexibility Choe et al. (2015). Impact of automation: Measurement of performance, workload, and behavior in a complex control environment Balfe et al. (2018). This happens to be the main problem that none of the previous studies in business research have addressed how many tasks are performed by machines and employees because there was no conception of a dynamo reference scale, organization performance is presented with employees' job performance mixed with machine performance as now a day most of the basic and skilled tasks are performed by machine, so in that regard, business studies are providing narrow view of automated machines because 70 to 80 percent of the tasks now a day in the manufacturing process are performed by machine. Therefore, this research study aims to address this main problem by introducing industrial engineering scale (dynamo reference scale for dynamic levels of automation) to business research studies the main focus is on the local textile mills of the Kotri industrial zone.

THEORETICAL FRAMEWORK

It is observed from the above literature that automation plays an important role in organization development and performance. Although the topic of automation in business studies has gained a significant amount of attention from academics and researchers. Most of the business studies in the literature have studied automation and organizational performance and individual performance and their results revealed that automation has a significant and positive impact on organizational performance and employees' job performance. It further states that most of the benefits can be achieved from mid-level automation. The previous studies have measured automation organizational performance and employees' job performance as a whole, when machine performance and employee performance are measured and combined with the act of overall organization performance, now none of the studies has bifurcated the tasks performed by machines and employees. Because now a day in most textile firms are fully automated and other

industries have implemented automation in production. It is observed that most of the work tasks are performed by advanced manufacturing systems till to finished goods only that part of supervision is left for human operators to do in this case now business research study needs to focus on automation as the main task performer not human.

The anomaly of their work is that they all measured levels of automation with the help of questionnaires and interviews because there was no scale at that time to measure automation separately, although it was not possible at that time and what they did is worthwhile. But now we have a separate scale from industrial engineering to measure the levels of automation (Dynamo reference scale for levels of automation) developed (Parasuraman, 2007). Some of the research is carried out with the help of the dynamo reference scale (Choe et al., 2015; Camara et al., 2019).

Therefore, in this research, we have taken the concept of automation as doing all the tasks to produce goods and services in the textile mills of the Kotri industrial zone. Most of the textile firms are automated, whereas Zaman textile mill is one of a kind that is fully automated from raw material to finished goods only the machine performs although there are supervisors who only supervise the machine nothing more than that concept is important in this age of technology where only machine performs not human, this particular research gap need to address in business literature.

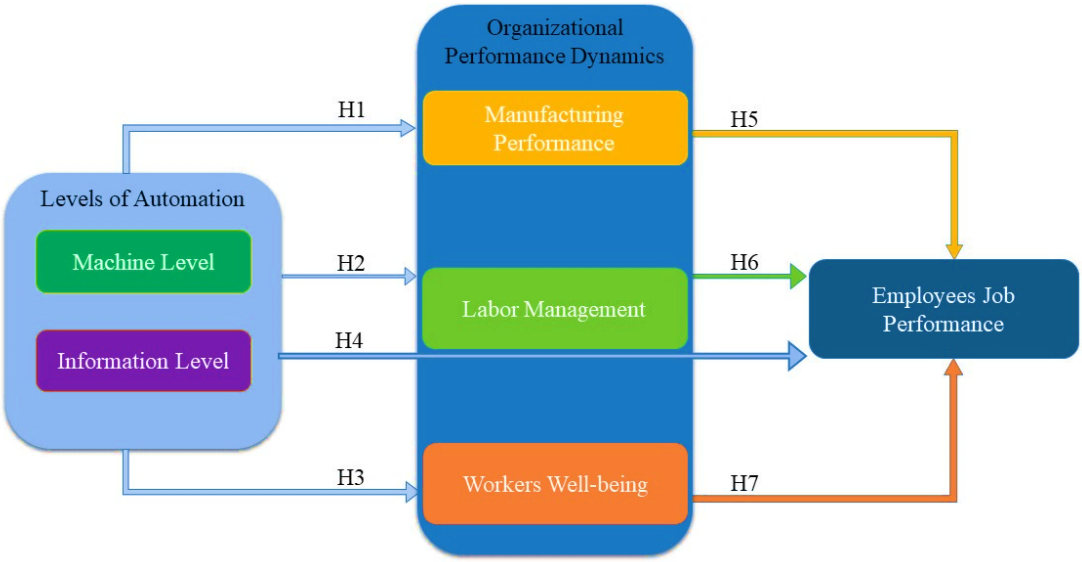

Figure 1. *Theoretical Framework*

LITERATURE REVIEW

Automation has a positive impact on organizational performance: Singapore manufacturing electronics firms' case. The research findings showed that electronic firms gain more from automation projects which came as no surprise. Because most of the electronic manufacturing companies were export-oriented and subjected to immense global competitiveness in consequence automation projects were supposed to be implemented with a strong focus on managing operational performance as a means to achieve greater competitiveness other two dynamics of the organizational performance factors like labor management, workers well-being were not at same performance as operational performance of the electronic firms (Wong & Ngin, 1997).

H1: *There is a direct significant and positive effect of levels of automation on Manufacturing performance.*

H2: *There is a direct significant and positive effect of levels of automation on labour management.*

H3: *There is a direct significant and positive effect of levels of automation on workers' well-being.*

Analysis of the effect of cognitive automation in a handling system of material in manufacturing flexibility, their theoretical model was the first material handling system level of automation that can be measured with DYNAMO++. Secondly, to what extent material handling system flexibility of manufacturing is affected by the level of automation? Finally, cognitive automation can increase the material handling system efficiently, and improve the flexibility of manufacturing. The study's findings indicated that the material handling system's cognitive and mechanical automation levels had increased by 52.4% and 48.0%, respectively. This had the effect of increasing the manufacturing system's flexibility in terms of cycle time, downtime, and job count by 14.2%, 53.3%, and 26.3%. Particularly, cognitive automation made improvements to cycle time and downtime that totaled 64.2% and 74.1%, respectively. This demonstrated the crucial role that cognitive automation plays in the material handling system's ability to manufacture products with flexibility (Choe et al., 2015).

H4: *There is an indirect significant and positive effect of levels of automation through Manufacturing performance on employee's job performance.*

The effects of level of automation and adaptive automation on human performance, situation awareness and workload in a dynamic control task; the primary focus of this study is on human-centered automation, where the first level was intermediate automation for maintaining operator involvement in complex system control and facilitating situation awareness. The second level was adaptive automation for managing the workload of the operator through dynamic control allocation between machine and human over time. The research study attempts to address the use of both approaches i.e., human-centered automation and adaptive automation. An experiment undertaken to assess the dual task scenario was performed.

Findings revealed that levels of automation are the driving force in determining initial or primary work tasks. Medium levels of automation produced higher SA and lower levels of automation performed superior but were not connected with higher productivity or workload reduction. When most of the primary tasks were automated, workers or operators were freed up and monitoring performance on secondary tasks improved. In common, the results are higher for intermediate or middle-level automation and adaptive automation as approaches to the theory of human-centered automation. But all levels of automation provide distinguishing benefits to human-machine system performance Kaber & Endsley (2004).

H5: *There is an indirect significant and positive effect of levels of automation through labor management on employee's job performance.*

The impact of workplace automation on work characteristics and employee well-being study demonstrates that the inducement of new advanced automation systems at the workplace may hurt workers' job resources. Furthermore, a serious threat to employee engagement for those who have to work with new systems stemming from an automation system relates to a lower level of automation and variation in work characteristics. Studies suggest that organizations need to focus on job resources that are potentially affected by the implementation of workplace autonomy, in addition to employee well-being and motivation, promotion is necessary to maintain during and after the digital transition Peeters and Plomp (2022).

H6: *There is an indirect significant and positive effect of levels of automation through workers' well-being on employees' job performance.*

RESEARCH METHODOLOGY

Research Design

When conducting social sciences research, it needs to design the full procedure of from data collection, justified site selection, research problem, and data collecting while considering ethical limitations and analysis methods, the role of the researcher throughout from first of the data collection process (Creswell, 2012). It known fact that the success of research mainly relies on research design which enables the scientist to acquire appropriate research steps required within the study model (Mangan et al., 2004). Moreover, the guideline of research provides full design of research which is a systematic process for conducting research from the first step to its completion of the research. However, every action within the process is an enabler for the next step to be carried out to meet the study objectives successfully provide a solution to the problem, or provide an answer to the research question.

The whole process of research design consists of three steps (Juuti et al., 2006). This initial step involves planning a research design with research aims and objectives to develop study hypotheses mainly based on causal relationships between factors (shown as a conceptual framework. This is followed by the establishment of educated gas or hypotheses from a detailed review of the literature published resonating with the research question and objectives. After understanding and completing the initial step research moves to its second step of developing a rationale for the sequence of measures to be applied under the methodology in checking reliability, validity of data, and relationships/hypotheses between developed factors of the study. Finally, it was time to collect data by researcher physically from the selected targeted population while keeping in concerned the limitations of the study. When data is collected according to the principles of data collection, the analysis of empirical data supported by discussions is carried out and finally ends with research implications and suggestions or recommendations for further research.

Sampling Design

The research data is collected from the employees of textile mills in the Kotri industrial zone. While the total number of textile mills in the zone is eight, with each firm employing on average around 450 workers the total number of workers amounts to 12800 in total and supervisors 1100 and number of major and micro machines in 1900. Out of this population, a sample of 850 employees, supervisors, and machines is selected for the data collection.

Research Instrument

Primary data is collected through a close-ended self-administered questionnaire filled by the supervisors of different departments and their employees of the textile firms of Kotri region.

In addition to that to measure the levels of automation in the textile industries of the Kotri region, a dynamo reference scale for levels of automation by Perasuraman (2007) is used.

RESULTS

Table 1. Respondents' Sample

Names of the Companies	Questionnaire Distributed	Questionnaire Returned	Response Rate
United Textile Firm	100	66	66%
Sphir Textile 1,2 Firm Ltd	100	94	94%
Quta Textile 1,2 Firm Ltd	100	68	68%
Nagina Textile Firm Ltd	100	69	69%
Awame Textile Firm Ltd	100	58	58%
Shadiman Textile Firm Ltd.	100	67	67%
Ameen Textile Firm Ltd	100	56	56%
Zaman Textile Firm Ltd	100	70	70%

In this study, 550 questionnaires were returned out of 850 distributed, which represented a response rate of 64.2% of the original sample. However, among those returned questionnaires, 2 responses were discarded because two of them were returned completely blank. Thus, the remaining 548 questionnaires were used for further data analysis. Subsequently, the final response rate in this study was 64.0%.

Table 2. Quality Criteria (Predictive Accuracy)

Endogenous Latent Variable	R Square	R Square Adjusted
Employees' Job Performance	0.644	0.641
Labor Management	0.142	0.140
Manufacturing Performance	0.180	0.179
Workers well being	0.132	0.130

Table 3. Construct Reliability and Composite Validity

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Employees' Job Performance	0.830	0.831	0.874	0.502
Labor Management	0.804	0.808	0.872	0.631
Level of Automation	0.809	0.812	0.913	0.839
Operational Performance	0.782	0.784	0.859	0.603
Worker's Well-being	0.772	0.773	0.854	0.594

Table 4. Discriminant Validity through HTMT

	EJP	LM	LoA	OP	WW
Employees' Job Performance	0.708				
Labor Management	0.632	0.794			
Level of Automation	0.463	0.376	0.916		
Operational Performance	0.695	0.490	0.424	0.777	
Worker's Well-being	0.675	0.663	0.363	0.561	0.771

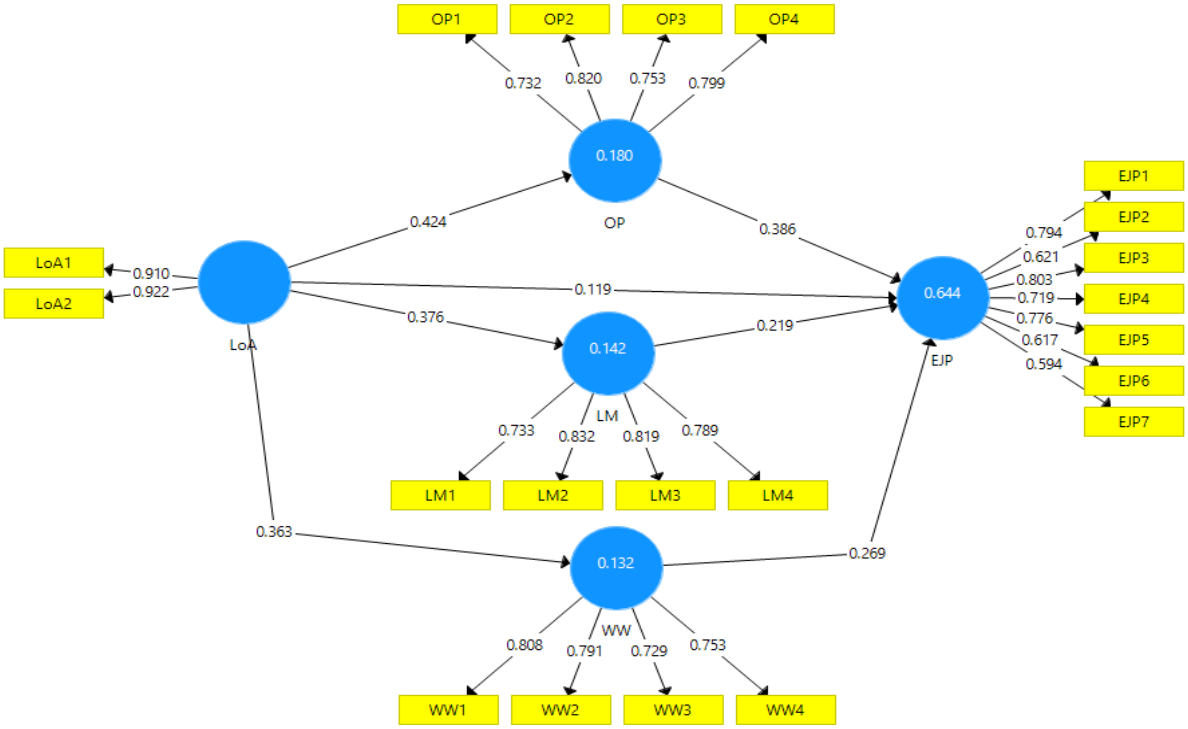

Figure 1. *Standardized Measurement Model*

Table 5. Direct Effects

	Relationship	Beta	Std-Error	T-Value	P-Value	Accepted/ Rejected	F2
H1	LoA -> MP	0.424	0.044	7.560	0.000	Accepted	0.352
H2	LoA -> LM	0.373	0.038	10.346	0.000	Accepted	0.185
H3	LoA -> WW	0.363	0.040	6.499	0.000	Accepted	0.032
H4	LoA -> EJP	0.119	0.036	4.635	0.000	Accepted	0.055

Hahn & Ang (2017) asserted that only p-values are not the upright criterion to test the significance of the hypothesis & suggested to use of an amalgamation of criteria i.e. P-value, confidence intervals & effect size.

The results shown in Table 5 confirmed that the following four hypotheses tested were statistically significant and supported.

H1. The levels of automation have a significant and positive impact on organizational performance dynamics of manufacturing performance.

As shown in Table 5, the beta vale and t statistics for LoA to MP are 0.336 and 7.560 respectively, indicating that the path was statistically significant at the p=.001. The results showed strong support for hypothesis H1, which is proposed in the model. This highlighted that the levels of automation have a strong significant effect on the organizational performance dynamic of manufacturing performance, it is noted that an increase in levels of automation would positively influence the manufacturing performance of the firm. In short, levels of automation were a major determinant of organizations manufacturing performance.

H2. Levels of automation have a significant and positive impact on organizational performance dynamics of labor management.

As it is presented in Table 5, the beta value and t statistics for LoA and LM 0.395 and 10.346 respectively, showing statistical significance for H2 at p= 0.001. The results showed strong support for hypothesis H2, which is proposed in the model. This highlighted that the levels of automation have a strong significant effect on the organizational performance dynamic of labor management, it is noted that an increase in levels of automation would positively influence the labor management of the firm. In short, levels of automation were a major determinant of organizations' labor management, but manufacturing performance has a stronger relationship than labor management.

H3. Levels of automation have a significant and positive impact on organizational performance dynamics of worker's well-being.

As it is presented in Table 5, the beta value and t statistics for LoA and WW 0.260 and 6.499 respectively, showing statistical significance for H3 at p= 0.001. The results showed strong support for hypothesis H3, which was proposed in the model. This highlighted that the levels of automation have a strong significant effect on the organizational performance dynamic of workers' well-being, it is noted that an increase in levels of automation would positively influence the worker's well-being of the firm. In short, levels of automation were a major determinant of organizations worker's well-being, but manufacturing performance has a stronger relationship than worker's well-being.

H4. Levels of automation have a significant and positive impact on employee's job performance.

As it is presented in Table 5, the beta value and t statistics for LoA and EJP 0.168 and 4.635 respectively, showing statistical significance for H3 at p= 0.001. The results showed strong support for hypothesis H4, which was proposed in the model. This highlighted that the levels of automation have a strong significant effect on employee's job performance, it is noted that an increase in levels of automation would positively influence the employee's job performance of the firm. In short, levels of automation were a major determinant of organizations' employee job performance, but manufacturing performance has a stronger relationship than employees' job performance. Although the relationship between levels of automation and employee's job performance is a direct relationship here it is not supported in theory and practice. So, in that regard, this particular hypothesis has no significance in real organization settings.

CONCLUSION AND DISCUSSION

The study's goal was to comprehend the idea and function of automation or levels of automation to boost or increase the performance of an organization or employee's job performance. The researcher created the expected hypothesized model, which was statistically evaluated to understand the direct influence of automation levels on workers' performance on the job and the mediating impact of these levels on the three dynamics of organizational performance. The scope of this study was limited to multinational corporations, specifically those operating in Pakistan that produce quickly evolving or fast-moving consumer goods and whose R&D is based outside Pakistan (specifically the textile spinning mills of the Kotri industrial zone in Sindh). As the industry here in Kotri Textile Mills is undergoing a transition to automated manufacturing as their R&D is located outside of Pakistan, they are also multinational firms that are also facing global competition and demand as they export their all products in different countries. In that regard, these all-textile firms located in the Kotri industrial zone mentioned in the data collection section are introducing new advanced automation projects to meet global demand (Dennis et al., 2002).

Therefore, it was found that these all industries located in Pakistan are investing to automate their industry to keep the pace with global market and it is not possible without introducing new automated machines or they all need to increase their levels of automation. Although keep in view the strong competition in mind every industry throughout the world has adopted new ways of manufacturing to compete in the market and it's the same for Pakistan. While adopting new advanced manufacturing technologies none of the industry or academics has diverted their attention to words measuring the level of automation or at what level of automation we are

working with. Even the human resources department which is usually responsible for firing employees during new automation project implementation, never thought about what the minimum and maximum level of automation would be suitable for their organization. Because there was no concept of measuring levels of automation or there was no tool or scale available to measure it in concrete trams at what level of automation presently, they are working with. Parasuraman (2007) an industrial engineering researcher, developed the dynamo reference scale for dynamic levels of automation to accurately measure the level of automation. In this particular research project, the researcher has adopted the same scale as Parasuraman (2007) to identify the levels of automation in business research studies to address the issue in business studies that we can adopt the scale from industrial engineering to understand the levels of automation concept and its impact on organizational performance and as well as employee's job performance. Now the question is why we are adopting this particular scale from industrial engineering because at the time of the Industrial Revolution industries usually employed thousands of workers to work with the machines and most of the tasks were performed by humans and heavy and hazardous tasks were mainly performed by humans and human resources department was busy in taking maximum performance from available human resources and to motivate them to boost employee's job performance. But as technology became advanced day by day through technology automation fulfilled its promise to take humans out of the dangerous environment of the industrial production process. In this regard, every industry adopted advanced manufacturing processes with time to compete in the market but in the same situation people or employees were losing their jobs through automation, well now we are at the peak of advanced automation where organizations do not need much of the workers to complete the task but only a few of the workers are needed to performance the supervision task which is only left for a human worker to perform. In this situation we need not study humans but the machine at what level a particular organization is working with needs to be addressed in business studies to understand the role of level of automation plays in boosting organizational performance and employee job performance. So, in that regard, it comes naturally being researched to have an in-depth look into automation levels and their impact on organizations and employees.

Finally, with the help of the dynamo reference scale, we have found that most of the textile mills of the Kotri industrial zone are working with 5^{th} and 6^{th} levels of automation which is a total of 75% of the 8 textile industries are working, which means 75% of work tasks are performed by machine which are of 6^{th} and 5^{th} level of automation. However, Zaman textile mill which is one of its kind textiles spinning mill operates at the 7^{th} level of automation, which

is machine level at 7 automatic, information level at 7th automatic which contributes 8% of the total work task of all textile mills of Kotri industrial zone is taken 83% of work from the available level of automation. After measuring the level of automation, we have measured the impact of levels of automation on organizational performance three dynamics manufacturing performance, labor management, worker's well-being, and last construct of employee's job performance. Although results gave strong support in favor of automation that organizational performance three dynamics and employees' job performance are significant and positively correlate with each other however, many of the benefits can be achieved from manufacturing performance (Balfe et al., 2019; Choe et al., 2015; Wong & Ngin, 1997).

Summary of Results

According to the findings, six of the seven pathways were supported, and one was not based on no evidence available in the literature that there is no direct relationship of levels of automation with employee job performance. Because only organizations can procure automation projects not employees. In an organization setting there is no evidence, but this direct relationship is only possible in an entrepreneurship business setting. This particular model facilitates understanding the overall relationship between the level of automation and organizational performance as well as employee job performance. The model results state that levels of automation LoA have a greater impact total of 0.644 percent of the variance (R^2) in employee's job performance EJP which is an indirect relationship with LoA through organizational performance three dynamic where manufacturing performance (MP= 0.180), labor management (LM= 0.142), worker's well-being (WW= 0.132). It demonstrated that the model's explanatory capacity within the employee's job performance (EJP) was acknowledged at a reasonable degree (R^2 =64.4% utilizing Smart-PLS). EJP was the most important determinant, followed by MP, WW, and LM.

RECOMMENDATIONS

The aforementioned research suggested a model to investigate the idea of levels of automation in a given industry and to measure the automation levels and the impact it has on organizational performance three dynamics (MP, LM, WW) and employee job performance for textile firms. However, to extend the scope of study for external validation of the proposed model it can be applied to any industrial setting under LoA and its impact on employee job performance and organizational performance in any region or different country setting by comparing both local as well as international companies with advance manufacturing system available at their end.

This particular study collects data through a survey questionnaire and machine levels are derived from using a dynamo reference scale for levels of automation meanwhile it is based on sample size. Keeping that in view future researchers may opt for multiple options to conduct the same scientific enquire with an extended sample size with different industrial settings also conducting the interview and focus groups at the middle level of the management it will serve as evidence for the possible contrasts in the findings on other hand it will be of a dynamic value and body of knowledge as a contribution within business and automation study.

However, the research is based on a model, and its hypotheses are verified through the collection of data primarily. The requirement for an exploratory analysis is strongly emphasized for many of the differing perspectives of automation and its levels. Numerous novel questions for the study are raised by this concept whose potential replies could cause a paradigm shift in the way business organizations have been evaluating their success via their levels of automation.

Last but not least, from the viewpoint of levels of automation, this study was limited to the textile mills and was quantitative. There is a significant vacuum in the literature that future research can close by focusing on different aspects of the levels of automation like in a different industrial setting where many product-oriented organizations are working with advanced manufacturing systems will provide an understanding of the concept in other organization at what level of automation they are working with. In a similar vein, from a methodological standpoint, quantitative and qualitative analysis of this particular idea with the implementation of advanced methods will produce intriguing and dynamic results both for the comprehension of levels of automation with dynamic reference scale and their impact on organizational performance and employee's job performance.

RESEARCH IMPLICATIONS

The proposed framework of this study, as well as its outcomes and findings, serve as the foundation for the research implications. In research, recommendations are typically divided into two views. The first is to recognize the study's theoretical and methodological offerings, and the final category is to recognize the implications of the research for management and practice. The research's theoretical, methodological, managerial, and governmental ramifications are discussed in the section that follows.

Theoretical Implications

The main goal of this study was to create a theoretical framework that can improve business studies' automation theory and practice. For further explanation of theoretical contribution. It

would be quite easy if we divide theoretical contribution into two parts one would explain, how to measure levels of automation in business studies and the second is to measure the impact caused by the levels of automation on organizational performance three dynamic and on employee's job performance. Starting with the measurement of levels of automation as in business studies literature there are lots of research studies conducted by researchers on the impact of automation projects on organizational performance which show that all previous studies have measured the automation with help of interviews from upper management like CEO, managers, and supervisor or by the help of Likert scale. Although measuring subjective phenomena with an interview or by questionnaire is the right approach to conduct a social inquiry when talking about automation or levels of automation is a scientific enquiry and should be measured accurately. The problem is when all these previous studies were conducted there was no proper tool to measure automation in business studies, in that regard, all previous studies in business studies have measured automation with the help of interviews and questionnaires. Although measuring quantitative data with qualitative tools of social science is inappropriate it will not produce actual results. But what was being done by all previous research is right because there was no scale to measure the levels of automation or simple automation, what they have done is worthwhile and worth mentioning but it's not a reliable way or method to conduct a scientific inquiry in social sciences. In that regard, researchers have to review industrial engineering to deal with this issue to measure levels of automation with its own scale for measuring levels of automation in industrial settings. So, the idea came naturally to research to find a scale to measure it properly in business.

Therefore, this particular project of PhD research involves Raja Parasuraman (2007), dynamo reference scale for dynamic levels of automation is adopted, The scale gives out actually three main results, first it measures level of automation of particular industry, second it measures tasks performed by human and machine it clearly bifurcate the tasks and finally it suggests which automation level is better for your particular organization mid, lower or higher level of automation, although this particular step is not achieved in the research project because that was not the research objective to suggest level of automation. This is the first and for most important outcome in theoretical contribution of the research to introduce scale to measure level of automation in business studies. The second part of theoretical contribution is to explain the impact cause by levels of automation on organizational performance and employee's job performance. The research gives strong support to automation project (Balfe, 2019), that it positively and significantly correlates organizational performance with three dynamics (manufacturing performance, labor management, and worker's well-being) and employee's job

performance. But most of the benefits can achieved from manufacturing performance Wong and Ngin (1997) second from labor management and lastly from workers' well-being. Finally, any organization can benefit from automation projects as they increase their level of automation. Although it was a challenging task to measure levels of automation in business studies but achievable.

Methodological Implications

In the context of methodological implication, most of the previous studies on automation have measured the automation with the help of the Likert scale, as the Likert scale was developed to measure subjective phenomena like satisfaction, stress, and other feelings which are subjective, where the construct of automation is scientific and quantitative it should be measure with a proper scale which is developed for measuring the levels of automation. Most previous studies in business research with the context of automation have used the Likert scale to measure it which is an indirect way to measure automation. In this study researchers have adopted an industrial engineering dynamo reference scale for levels of automation, to accurately measure the level of automation of any industrial setting. This is one of the major contributions of the research which will help new and senior researchers to understand how automation projects can be quantified up to what extent we are working with automation, or the total number of tasks performed by humans and machines. (After carefully examining the suggested theoretical framework utilizing structural equation modeling (SEM) using PLS, which belongs to the second generation of analytical techniques for quantitative investigations, this study also contributes to the field of study from a methodological standpoint. In addition to using traditional regression techniques, single-layered correlations between independent and dependent variables were examined using factor analysis, ANOVA, and MANOVA. That said, by employing structured equation modeling, numerous layers of interactions can be represented simultaneously to respond to all connected research issues more thoroughly and methodically (Gefen et al., 2000). The application of each measurement and structural analysis provides support for a thorough explanation of the observed connections and the possible step-by-step instructions for future research projects, including those involving construct reliability, item reliability, convergent and discriminant validity, explanatory power (R^2), path significance (β-value), and goodness-of-fit indices, in that order.

Managerial Implications

Managerial implications of automation include changes in the way work is organized and managed, the skills and knowledge required of workers, and the impact on jobs and

employment. Automation can lead to increased efficiency and productivity, but it can also lead to job loss and the need for retraining or upskilling of workers. Managers must consider how to effectively implement automation and manage its impact on the workforce. This may include developing strategies for worker retraining and upskilling, managing the integration of automated systems with existing work processes, and addressing any potential negative consequences such as job loss or changes to work conditions. Apart from the managerial implications of research are falling in three major categories, one which will help manager to understand at what level of automation of current organization with the help of dynamo reference scale of Parasuraman (2007), at what level of automation they are working with, as here in Kotri textile mills of industrial zone are at 5^{th} and 6^{th} level of automation with which states that these industries are moving towards full automated systems. Second with help of same scale used can determine number of tasks performed by humans and machines, as here in Kotri textile mills of industrial zone most of the 75% to 85% of work tasks are performed by automated machines. Finally, with the help of this research manager can understand up to what extent automation project is utilized and which factors of organizational performance are affected. As in case of textile mills of Kotri industrial zone, result shows that organizational performance three dynamics namely manufacturing performance MP, labor management LM and worker's well-being WW, where most of the benefits can be achieved from manufacturing performance as compared to LM and WW.

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