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HRM Technologies: Redefining HR Processes in the Manufacturing Sector

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Abstract: The present research focuses on the impact on HR practices and processes as a result of technological advancements. It is conducted to gain knowledge and understanding on the change in technology and its effects on the human resource department with respect to the manufacturing industry. It is based on the in-depth analysis of various researches done in this field. A qualitative, secondary research was conducted to gain theoretical knowledge on how the professionals of the manufacturing industry and the HRD are getting affected due to the constant change in technology. The researchers have also conducted semi-structured interviews with HR professionals at middle and senior levels within the manufacturing organizations in major cities of India. With the help of strong constructive findings and discussions, the key aspects are analyzed and evaluated and a precise conclusion is formed. The research explored how key HR processes are changing with the change in technology

Key Words: Technology, Human Resource Management (HRM), Manufacturing, HRIS.

INTRODUCTION

With the advancement of technology through the ages, the world of business has changed ten folds and still counting (Lewis, 2017). A great example till date is the introduction of the assembly line technology in the automotive manufacturing industry brought into the limelight by Henry Ford of the Ford Motor Company. In the present day and age of information and technology, there is to be seen a great advancement of Information technology (IT) as well as manufacturing technology. It is observed that most manufacturing units, let alone other businesses, cannot function properly without the use of technology in any form. This impact is seen in all segments within every business setup including the human resource department. In the human resource department, it is seen that technology has significantly impacted the way human resource executives are implementing the human resource functions and practices (Lewis, 2017).

Swift changes in information technology and hardware technology have shaped manufacturing units and businesses alike in many ways than one can count. From the world becoming a global village to adjustments made to the workforce in an organization focusing primarily on itinerant opportunities of jobs. With this, human resources have had the need to acclimatize rapidly. It is now understood by the human resources professionals that to stay ahead of the game and be at the core of change, HR must focus on the advancements in technology. It is predicted, that by 2020, 75% of the workforce will be made up of millennial. Hence, human resources in any organization, be it manufacturing, hospitality or even information technology (IT), must accept the changes in technology and implement it within the processes of the organization to be at par with the expectations of the employees and the requirements of the businesses. It is understood that talent and workplace analysis done by management and employees and potential employees is becoming more common while the use of technology in the manufacturing industry and other organizations will become more competitive as the human resources department will then focus more on competent recruiting and retention of employees. This will be so because of the increase in technical knowledge of the available workforce within the market (Biro, 2016).

Berman, Bound, and Machin (1997); and Wood (1998) highlight that with effects to high competition between manufacturing organizations as well as the skill sets of employees, there is said to be a downsize of unskilled and semi skilled workers. In contrast, there is an increase in the absorption of high skilled people or specifically skilled people, i.e. in specific to the technological changes within the manufacturing industry. It is also observed that there are certain skill based technological changes made in the industry. This is when many manufacturing organizations are upgrading or changing their existing technology to a specific person's knowledge of running the machinery. The demand and importance of advanced technological skills in the ever changing technological world clearly shows that the organization's Human Resources Department has its job cut out to study, procure, train and retain such highly skilled and high priority employees or potential employees (Machin & Reenen, 1998).

Now focusing on the human resource aspect, it is recorded that technology was only utilized for tasks related to administration like payroll, attendance, and so on. Over the years, with the advancement of technology and the introduction of it in day to day aspects of all the departments of the organizations, it is observed that professionals in HR now depend on technological systems to make their job easy (Bagga, 2012). Such automated systems help HR professionals in various activities like salary payment, benefit fund segregation, training and development and so on (Technology concepts on HR, 2017). HR in the current gear of change also needs to focus on studying the potential employee market so as to understand the trend of employees which are available or are being trained so as to apply the information in setting the trend and culture of the workplace as need be (Srivastava & Bagga, 2014).

Workplace diversity and online information availability systems as per security clearance towards information are becoming more and more active within manufacturing and other organizations due to the advancements in overall technology worldwide. The 21st century has also witnessed advancements in research, development and implementation of assistive technology for the physically disabled people. This has opened up more job opportunities for them in many industries including the manufacturing industry. Manufacturing industry representatives, while giving their views of technology and its advancements state that this has helped them in recruiting from a bigger talent pool which has directly affected the overall running of the industry in a much more efficient way. The introduction of biometrics has increased efficiency of employees

towards their work as well as increased the security towards access of information. While, the availability of work from home, or e- offices have allowed more women into the workforce (Technology concepts on HR, 2017).

Good or bad, advancements in technology is gaining momentum, be it information technology or manufacturing. Even though it is expected that human resources professionals will benefit from the advancements in technology, there is also a high chance of major automation creating uncertainty in the 'human' aspect of any job within the manufacturing industry. Majority of the industry professionals feel that technology is the most prominent factor bringing a major change with regards to all the aspects of the human resource department in all industries (Christie, 2009).

LITERATURE REVIEW

Hunt (2011) clearly highlights the effects of technology on human resources (HR) within the manufacturing industries around the globe. Hunt highlights four (4) time periods which clearly show the significant changes in HR procedures and concepts. Pre 1990s, when HR was known as personnel management, administrative work was the key work done by the HR personnels. As there was much more time consuming work load due to the shortage of advancements in technology, only administrative work was looked into. The main focus of the 'office of personnel administration' was to process employee paperwork efficiently. Between the 90s and 2000, Enterprise Resource planning (ERP) technology was introduced to reduce time and effort for doing administrative work in the HR of manufacturing industry. Personal computers were also provided to HR personnels for individually done efficient work. From 2001 to 2010, internet was introduced within the manufacturing industry helping HR to share data and information more conveniently throughout the organization. The final stage started from 2011 with the introduction to cloud computing and other time and staff management systems, technology has now become an integral part of the HR department of the manufacturing industry.

Illert (2011) states three (3) benefits of technology in HR and the overall manufacturing industry. Benefits other than salary or the secondary benefits information like food deals, staff gym or gym memberships, time and work place flexibility and so on can be availed by all employees online. Due to the ease in access and availability, employees can avail or act upon this more conveniently, inturn increasing moral which effects positively on work and efficiency of staff. Instant feedback from employees can be availed by the HR team from the factory floor while the employees are working, making data available on a real time updated form for future evaluation. And finally, it helps develop experience of employee while using the technology. This is so as with advancement in technology, the ease of work increases which inturn improves the overall experience of individual employees while at work (Chetty, 2012).

Greengard (2000) writes that all processes can go completely digital or onlinewhich in the long run reduces cost and time consumed to do the work. It also increases connectivity between people across the globe. This also helps by expanding the workforce on a digital platform rather than in physical form. Non manual work can be given to some one who can work digitaly from where ever he or she is comfortable working from. Physical presence is not required to that extent. Transfer of information also becomes convenient and fast paced.

Biro (2016) also wrote four (4) more points highlighting the benefits of technology in HR and the manufacturing industry. From personal data and information of each and every employee to the most

important information of the manufacturing unit can now be stored in the cloud. This is done to comply with the ever changing laws and by laws of the industries and the government. Performance as well as performance management of the employees is more accurate with the help of technology. End products of the manufacturing line are more accurate and standardised now than ever. This also includes the continuous appraisal and evaluation of the employees as discussed. The author also enforces few points as discussed above by other authors, that secondary benefits and information with regards to those benefits and procedures are also now on a organization wide accessible system as per each individual employee's security clearance. It is also stated that advancement in technology increases the engagement of the employees in their work and amongst co-workers.

Kumar and Kumar (2013) highlight the following challenges faced by the employees as well as the HR department through the changes and advancements of technology. The level of skills required by the employees increases with the advancement in technology. This also effects in downsizing of the workforce as technology and machinery takes over the positions of low skilled jobs and positions. This leads to increase in collaborative work amongst employees as well as between manufacturing units. Communication improves as there are now more faster ways of communication increasing efficiency and improves on the quality of manufacturing and end products (Jain, 2014).

Lileeva and Biesebroeck (N.A.); and Baldwin and Sabourin (N.A.) project their researches the change in the style of production in the manufacturing industry. With the change in and introduction of advanced technology which reduces time spent on production, the speed of production and the amount or quantity produced has increased a great amount. This change in the production dynamics has led to companies change their style of production to small to medium scale and medium to large scales of production. While this is done, the skill levels of employees are being required to be increased along with this change so as to retain them within the production line of the organization. If this is not done, it is leading to the immediate downsizing of the manufacturing unit. With reference to this, many manufacturing industry personnels as well as zonal HR managers confirm this effect of technology on the Human Resources within the manufacturing industry.

Molleman and Slomp (2001) and Alcorta (1992) highlight through time that the impact of growth in technology in the manufacturing industry has changed from a cellular level design into a fully functional system in which the smaller segregations have diminished, downscaling of employees is seen and also the use of less but much more advanced technology is introduced onto the organization floor (IPTS, 2001) (Hornstein, 2005) (Mabry & Sharplin, 1986). This has resulted in high usage of technology, employment of high skilled workers, grouping of resources under one roof, and making the employees more sloped towards the process of manufacturing the product. Within the Indian manufacturing industry's context it is recorded that technological advancement have increased the GDP from 8.9 in 1950-51 to 14.6 in the year 2008-09 as per the Central Statistical Organization of India (MOSPI, 2017).

On the contrary, as per Genpact (2014), West (2016) and Riche (1982) state that the advancement of technology has not only helped in the growth of the manufacturing industry in terms of organizational growth in production and profit but also in the availability of jobs. Even though it is calculated that an average of 16 percent is gained through labour cost saving due to the technological advancements, but it is observed that affected workers are more likely to be transferred to a new job within the organization (Mark, 1987) (Arslan & Erdil, N.A.) (HR Strategy, 2014).

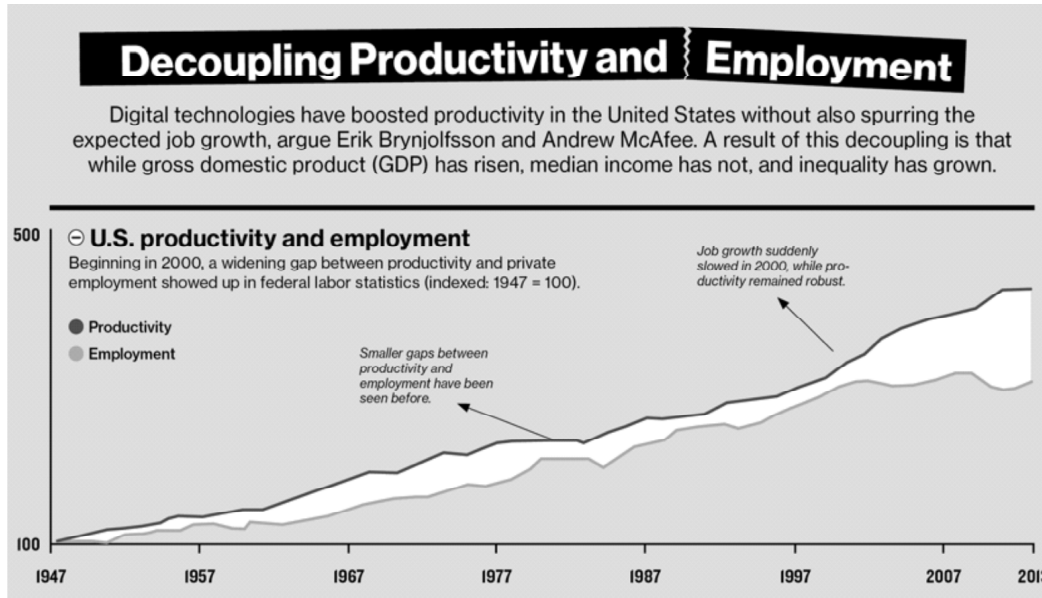


Figure 1.1: Productivity and Employment Scale (Rotman, 2013)

With a broad effect on the manufacturing industry and a direct effect on the human resources department who are the support system for all employees within the ever changing industry due to the technological advancements, this research focuses on the effect of technology in the manufacturing industry from the view point of the Human Resource Department (HRD).

THE IMPACT OF TECHNOLOGY ON HR PROCESSES

In the earlier days, as per Biro (2016) Human Resource professionals were dependent on technology just for limited task like payroll and maintenance of regularity of employees using attendance. During the recent years, technology has played a very important role in shaping the present and the future of Strategic Human Resource Management (Bagga & Srivastava, 2014).

Rietsema (2016) states, that the Human Resource Information System (HRIS) has simplified the job of evaluating and analyzing huge data. This was possible only because of the boom of internet and computers in the last decade. This integrated system (HRIS) is designed in a manner that it can be used in HR decision making (Bulmash, N.A.).

It is also observed that adoption of technology in HR has resulted in a lot of cost savings. Training and development is a key function of HR. The use of technology in this field has immensely helped a lot of organizations like IBM which saved \$100 million from online training. Similarly, the integration of technology with HR functions can result into tremendous cost savings for the organization (Institute of Management and Administration, 2017).

The involvement of technology in HR is increasing day by day. Two decades back people looked HR as a completely human driven field with most of the work as clerical and based on human interaction, with no possibility of integration technology into its tasks. But the involvement of technology in all the essential activities of HR is commendable. The field of HR has undergone a major transformation with the use of

technology. There are many changes that are still in the pipeline which will affect the conventional working of HR services (Johnson & Gueutal, N.A.).

Now let's put some light on how the technological changes have affected key HR activities: acquiring, rewarding, developing, protecting and retaining.

Acquiring

Ramey (2012) highlights, the main activities of HR in this field are recruitment and selection. Recruitment has been influenced the most with the use of technology. More and more companies use internet to post job advertisements and to receive resumes. With this, the companies are receiving larger number of emails than before.

Also, now the time taken to fill a vacant position is much less because of the same reasons. Internet gives access to global talent all over the world rather than just local talent. But at the same time we cannot ignore the challenges faced like the overload of resumes for the recruiters. For maybe 5 or 6 positions, we might get above 500 resumes (Parry, 2010).

One more challenge is that the internet is not so useful in recruitment of senior executive positions like director or vice-president (Chapman & Webster, 2003).

In the selection process, which is an important activity on acquiring, the computer based applications have the capability to screen resumes and appliers for a particular post. However, they are not so effective. The main issue is that, by the passage of time, the applicants have learned about some key words which they try to accommodate in their CV to beat the system (Essay, 2015).

As it is the initial process of HR, it has been affected most by the technology. Gone are the days when the companies used to post their advertisements in the newspaper for job openings. The process has become tremendously fast with the help of technological advancements. The advertisements are posted just with a few clicks. In the same way, the applicants can apply for that particular job within seconds. After that the applications do the task of screening resumes. Earlier, the resumes were screened manually which was really a tedious job as you might get more that 500 resumes for a particular job posting.

Rewarding

Huhman (2014) stated that performance management and compensation & benefits are the key areas of rewarding activity of Human Resource Management. HR now has the ability to generate appraisal forms and make them available on-line. However, most of the organizations still prefer hard copies for their records. But if the appraisal system is automated, it will lead to a lot of cost saving. Till date there is no effective 360 degree feedback tool available that can be used in performance management of employees. With the help of appraisal software, the lives of HR professionals can be eased (O'Brien, 2017).

For compensation and benefits as well, HR has used technology in a useful way. The HR department of the organization introduces the employees to the benefit options and then the employees fill the details online about their contact information. For example General Motors has provided the employees with an online HR portal known as Employee Service Center. Through this tool, the employees of GM can monitor their benefit plans (Ensher, Nielson, & Grant-Vallone, 2002).

This activity of HR has not been affected much with the advancement of technology. Although companies have started thinking about making the appraisal system automated, they are not able to completely adopt that. For compensations and benefits, many companies like Gen-pact, India have an online portal for reward points. The reward points of an employee are collected from the start based on the performance. Employees can redeem gifts or cash from those points. It is a very beneficial option. Employees get to see a variety of gifts/ benefits on the portal and order accordingly. It also motivates them to perform better as the employees would want to collect more and more points to get their favorite benefits.

Developing

Organizations spend a lot on their training and development programs. In the past few years, the need for training and development has increased as the managers and employees are multi-skilled now. Online technology provides low cost solution to organizations for training and development. The online learning is faster and free from the limitations of time and space. After the completion of training, the online portal can also be used to evaluate and measure the effectiveness of the training given to the employees. One more importance is that with the use of technology, proactive planning can be done in order to develop employees through training (Gasco, Llopis, & Gonzalez, N.A.).

Supporting the points discussed, Selvan (2015) also states that online learning also has the capability to deliver the study material at the same time and place wherever the employee is. Compliance training such as discrimination at workplace can also be provided to the employees online. While the training process is fastened, at the same time, the feedback process is also fast-tracked. The employees get the feedback then and there about their performance in the training. While there are these benefits of online training, on the other hand people might not like online evaluation as they do not want to miss the classroom environment. Also, there are many noises like the knocks on the door that can interrupt the employee while completing the training online. These cannot be neglected.

This activity of HR has also been affected at a large extent with the advancement of technology. The employees can perform training activities anytime and anywhere. There is also a certificate that the employees get online after the successful completion of the training. This saves a lot of time and cost. The organizations can allot trainings to different employees as per their requirements. The feedback is also available straight away without waiting for a long time. The system automatically evaluates the training and sends the scorecard straight away. Organizations also go for virtual trainings that is done using video conferencing. It doesn't matter if the trainer and the trainees are located in the same area. Video conferencing has broken the barriers and the boundaries of the nations.

Protecting

Maintenance of health, safety and wellbeing of employees is really important for the organizations. As we know that the employees make up the organizations, the condition of the employees determines the status of the organization (Ensher, Nielson, & Grant-Vallone, 2002).

Due to the advancement of technology, the numbers of employees using computers have increased tremendously. This has raised questions on the health of the employees. It is necessary for organizations to pay attention on the injuries and stresses that arise with the use of computers. Although technology has

increased the flexibility to work, it has also obstructed work-life balance of employees, increasing stress levels. HR professionals suggest that it is very essential to let the employees know about the importance of taking breaks on time and moving around for a while after sitting on the chair for a long time.

The protection function of HR also includes the concerns about employee relations and legal issues. The organizations are responsible for treating their employees fairly without any biasness or preference. There can be a misuse of technology by the employees. There are several cases reported against employees for circulating inappropriate e-mails related to sexual discrimination. In fact there are many terminations and suspensions carried out for storing sexually explicit material (Ensher, Nielson, & Grant-Vallone, 2002).

One more concern regarding the misuse of technology is the employees visiting various porn sites. Organizations can avoid it by putting firewalls. Data security methods like encryption algorithms can be applied to avoid the misuse of data.

Retaining

Lauby (2015) points out on employee retention that it is very critical for the organizations to retain talent. This also leads to reduction in cost. It is a compelling challenge for the HR professionals to be able to retain good employees. Our HR professionals need to closely monitor the trend of employees leaving the organization. They need to understand that why people leave their organization. The data can be obtained by determining the turnover rate. We can understand the true reason by conducting exit interviews and opinion surveys of employees. These two processes can be completely automated with the help of internet. The exit questionnaire and surveys can be filled online.

Also, organizations should address the issue of work-life balance as the employees today are very concerned about it. The organizations can include this topic as a topic of concern during recruitment as well as retention. The organizations can improve the work life balance of their employees by using flexible scheduling. In this process, the time of work, location of work and other aspects are looked into for the convenience of the employees. In this way, the employees are able to manage their work as well as give time at home.

The technological changes have actually helped the employees to maintain a better work-life balance. For example, people who stay away from home due to work can be in touch with the family members using cell phones. If the organizations allow the employees to speak to their dear ones over video conferencing using applications like Skype, it will be advantageous as it will increase employee motivation and performance. For that a good internet connection is needed which is already present with most of the organizations. This way, the employees will also have a sense of feeling that their organizations are concerned about them.

Mamoudou and Joshi (2014) conclusively state that even though Information Technology (IT) and other technology is used by the HR department in the manufacturing industry to go through the daily works, it is observed that it is used the maximum for career management and advancement. Employees are eager to enroll themselves in technical training programs offered by the Training and Development (T&D) department to better improve their knowledge, skill and chances of retention in the organization. Recruiting and idea management is also utilizing a lot of technology in the present scenario. In contrast, training, communication and health and safety are not advancing technologically. Specifically in the manufacturing

sector, where there is use of heavy machinery, advancement in technology will improve the employee's health and safety conditions while working. With new technology, training and development will also benefit the management as well as the employees. Finally, communication processes can also be improved specifically on the factory floor where the laborers and low level staff are working.

Including the basics of HR management, and the present day impact due to technology, causing downsizing in the manufacturing industry, high skill development and recruiting, and collaboration of work, the Human Resources Department within the manufacturing industry is also facing challenges due to these changes. Virtual HR is being introduced into the industry slowly but steadily. HR personnel are now recruited from a wider talent pool, increasing the competition in the existing employees. Individual IT skills and psychological profiling has become integral while selecting HR professionals as they might as well be asked to work from various locations across the globe and use a variety of advanced technology for communication (Purohit, 2015).

Bodi (2017) talks about the future of technology effecting HR in the manufacturing industry. The research highlights that virtual reality and wearable technology will help the HR department to communicate with the other employees much more efficiently even when the HR department will be an online thing rather than a physical entity. To retain their jobs, employees are now needed to be highly skilled in technology as well as soft skills. This is so because of automation being introduced into the manufacturing industries, making production more efficient and affordable while reducing manual labour. The trend of internet of things (IoT) is getting good recognition in the way training is now provided by the HR to the industry's employees. Online training programs are being given to employees for compulsory upgradation of their dossier and also to provide them with a better career growth within the organization. In the middle of change, there may still be a silver lining. It is predicted that job description for employees will no longer exist as they will rapidly be changing to sustain in the next day's workplace (Society for Human Resource Management, 2000).

Bono and Pillsbury (2016) suggest a new and improved reward and risk equation which can be utilized by the HR personnel of the manufacturing industry.

- Establish the precise areas to advance in the organization. – By doing so, investment in technology can be focused onto just those precise areas and labor downsizing can be controlled.
- Recognize how the latest technologies will facilitate the level of performance. – By doing so, the HR can compare and contrast the advantages and disadvantages of investing in new technology.
- Be aware of the organizational propositions of the technology. – This is done so as to align the introduction of new technology with the projected future of the organization.

Lakkad (2013) and May (2017) suggest a change in the HR's model for managing this sudden and ongoing shift/ advancement in technology. A conceptual model as per them can focus on –

- **Strengthening the leadership of HR:** So as to develop a clear vision, motivate others to share that vision, and help them work toward achieving it. The HR leaders within the organization now not only need to focus on the HR department but also be leaders in the reshaping of the organization.
- **Precise Future Orientation:** understand how changing environmental, organizational, and workforce factors will likely influence the business, anticipate the associated HR needs, and be prepared to deliver appropriate solutions to meet those needs.

- **Creative Flexibility:** Responsiveness in the changing world will entail being flexible. As the technology change, so will the organizational needs and priorities. Traditional activities and processes will not be adequate enough to meet up with the exclusive needs of the future-HR leaders. They will tend to rely on the creativity and flexibility of their team members.
- **Job Rotation:** One way to bring the perspective of the business into HR-and vice versa-is to rotate line managers into the HR function for periods of time. These individuals often serve as reality checks for the HR group, and then bring an increased understanding of the value of HR back to their line function when the rotation is over. This approach seems to work best when the duration of the assignment is sufficient to allow the rotated individual enough time to become proficient in some area(s) of HR and when he or she is working closely with experienced HR people who can help them learn. Sending HR people into other areas of the business can serve a similar purpose.
- **Increasing the Line Manager's Competence:** Part of the future HR model is that responsibility for HR activities is shared between line management and HR people. This approach allows the manager to be more fully involved in the development and direction of employees, with HR as a resource; it requires, however, that those managers have the capabilities needed to work through issues with employees successfully. Many companies are therefore increasing line managers' access to information.

CONCLUSION

The research paper clearly shows that technology is at a constant rate of change. The manufacturing industry which is highly driven by technology in the form of machinery as well as IT is continuously getting affected by this change. Due to this, employees as well as the Human Resources Department (HRD) are needed to be on their toes to accept the changes and react constructively with the flow. The key points discussed in the report highlight that with the change in technology; employees in the industry floor of the manufacturing industry now need to be updated on their knowledge and skills to work on the latest machineries as well as on their soft skills for communicating with other departments and management using the updated IT gadgets. With regards to the HR personnel, they need to be updated on the latest HR systems and databases to carry forward with the day to day activities of HR from recruiting to retention. Also, as the trend of change forecasts, the HR professionals in the manufacturing industry as well as other sectors need to be able to handle work on the go.

Recommendations for Future Research

With the constant change in technology and its implications towards HR and the manufacturing industry, this research topic holds a lot of scope for further research. Researchers, academicians and stakeholders within the manufacturing industry can carry forward this research on their individual perspectives. Researchers can look into this topic on a global or a national level, while academicians can conduct research on educational and training aspects of future employees of the manufacturing industries. The stakeholders also can conduct their personal research on effects of change in technology in their own organization and strategies to overcome these challenges. More in-depth secondary as well as primary research can be conducted to give readers a more precise scenario of the situation.

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