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**A GENEALOGY OF HUMAN RESOURCE MANAGEMENT:  
TRADITIONS, TRANSFORMATIONS, OPTIMIZATION  
THROUGH INFORMATION TECHNOLOGY**

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*Abstract*

Advancement in technology and the ensuing rapid growth of Internet usage in recent decades, alongside with the evolution of organizational systems and software have driven organizations to replace traditional modes of Human Resource Management (HRM) with modern methods. The subsequent transformations, nonetheless, have engendered indispensable repercussions on the entirety of the organizations, affecting their whole configuration and structure, and unavoidably impacting on pivotal departments like human resource. Designing an organizational chart, for instance, that displayed human resources and the linkage among various sections and units became a prerequisite in setting up of any organization. The aim of the present study is threefold: First, it attempts to offer a genealogy of HRM transformation from traditional to modern pattern; then, it seeks to explicate the manner technological advancement has changed the direction of HRM; and finally, it aims at proposing a seven-goal-model for managers to optimize HRM process in future. The proposed model suggests that organizations must move up at a parallel way with the contemporary technological growth to be included and to survive in the existing competitive world. To achieve this final goal, the study also identifies the limitations of current HRM and in so doing attempts to offer novel directions for future studies.

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**Keywords:** Human resource management, information technology, information system, knowledge management.



## **1. Introduction**

One of the most essential assets of every organization is human resource about which management plays a key role to harmonize the organization's strategy with the strength of employment. Human capital and knowledge management initiate additional restrictions for organizations to act professionally and fulfil human resource expectations. Human resource management (HRM), however, is facing different challenges such as advancement of technology, transformation in economy, globalization, domestic diversity, political and legal changes, and so forth. These challenges enforce managers to attract, select, motivate, and retain talented employees to use their expertise among the competitors (Stone, Deadrick, Lukaszewski, & Johnson, 2015).

Emergence of new technology has affected the evolution of HRM process in terms of recruitment, training, knowledge management, etc. Other than modification in the process of HRM, Information Technology (IT) connected individuals to organizations, supervisors and subordinates. Technology innovations such as video conferencing, telework, web-based applications, and virtual team reduce the effects of distance in organizations whereby employees can be hired remotely from all over the universe (Aguinis & Lawal, 2013). Advancement of IT and its integration with human resource has led the organizations to design information systems to plan, enhance, educate, and evaluate the process of HRM. In this context, this paper aims to review the history of HRM and highlight the role of IT innovations on its efficiency. For this reason, a seven-goal-model for HRM optimization is proposed to assist organizations in setting their goals and moving towards it. Besides, the challenges, limitation and future of HRM are discussed to alert organizations, so that they can predict the future challenges to overcome their competitors and achieve success.

### **1.1. HRM Transformation**

The modern philosophy of HRM, in its contemporary form, results from a series of phenomenon and evolutions that began after the Industrial Revolution of 1760 in England and continues to the present day. However, the emergence of the gradual development of HRM may even be traced back to much earlier times, the ancient era, as there is some evidence that the syndicates, unions and organized proletarian strikes had occurred in ancient Egypt and Rome. Industrial Revolution occurred in Europe almost at the same time with other massive scientific, philosophical and political discoveries and evolutions of the 17th and 18th centuries (Deadrick & Stone, 2014). The Revolution primarily brought about the replacement of human resources with machines in industries. Subsequently, a major and direct consequent of the revolution was the emergence of huge factories in industrial societies that facilitated, for the first time, the employment of centralization of a great number of workers in one place. The use of machinery, as well as expansion, development, and the wide-spread prevalence of factory-based production has fostered a great lunge in the production valence of the Mankind. Moreover, the utilization of the machinery in the production lines, has facilitated the division of major load of works into minor tasks and thereby has enabled everyone to play a part in the whole system of production (Dulebohn, Ferris, & Stodd, 1995). Such a division of labour in the production procedure is explicated through making of a simple pin, whereby he elaborates that the workers, instead of performing multiple tasks, only and simply operate one machine, concentrate more, and hence, expedite the production procedure.

The establishment of a factory and relevant production system and the necessity of employment and gathering of a huge number of workers in one place, entails a creation of a new system that could make the supervision and monitoring of the group of workers possible. This new system initiated the emergence of a series of hierarchies consisting of factory owners, managers, supervisors and workers (Deadrick & Stone, 2014). Such a change in the workplace occurred in a time where there was not a big gap between the artisan and the apprentice. In other words, the Industrial Revolution, by widening the schism among different strata of the society constructed a new HRM system.

By using electronic systems, human resource department and the people in charge of it should be able to do all the work related to human resources of the organization by creating new patterns in the new managerial unit in a way that the least amount of time would be spent and the least amount of human resource stimulus is engaged. In other words, the new patterns should be designed in a way that the human resources would do their job without leaving the workplace and only through computers, could be informed of all the news, plans, and regulations of the organization, and could enhance their technical, scientific, and particular abilities. In the traditional method, the human resources, for all the employee-related works such as receiving the salary statement, participating in in-service classes, being informed of the new regulations and requesting for a leave, had to leave the workplace and refer to the human resource section, which, in turn, wasted time and reduced the efficiency rate in big organizations (Deadrick & Stone, 2014). Hence, it is crucial for the HRM to employ electronic, computerized systems, internal networks and other software and hardware facilities in order to achieve the goals of the organization. Investment in IT assist firms to enhance their productivity.

## **1.2. Effect of IT on HRM Process**

Advancement of IT in various aspects of society has had extensive impact on people's lifestyle as well as business operational environment. With adaption of IT and enhancement of relevant information systems, enterprises can have competitive advantage and grab the opportunity of working with external suppliers (Chang, Chang, & Lee, 2014). New inventions such as Smartphone and network facilities have changed the modes of communication, methods of payment for various purposes (Song, Yang, & Wang, 2017), receiving healthcare services (Keikhosrokiani, Mustaffa, & Zakaria, 2018), education system, traffic system (Sohr, Brockfeld, Sauerländer, & Melde, 2016), commerce and trading, automation system (Domingues, Carreira, Vieira, & Kastner, 2016) and so forth. Moreover, organizational processes such as project management, finance, as well as HRM require sophisticated technologies to be modernized and be adapted with society. Innovations in technology has also changed the method of recruitment, selection, motivation, and retain of employees that are part of HRM (Stone et al., 2015). Various studies have been done to evaluate the impact of technology and transformation on HRM. Relevant information of human resources can be accessible by administrative personnel, managers, employees, applicants, etc. using technologies such as Internet, intranet, or web portal (Lengnick-Hall & Moritz, 2003; Parry & Tyson, 2011). IT can be used as tool in developing countries for developing the human resources needed to compete internationally (Williamsz, 2006). The principal engagement of technology in HRM, however, is in collecting, storing, using and broadcasting information related to the applicants and the personnel. Hence, human resource information system plays an crucial role in HRM of any organization, and in this regard, IT has been introduced as a mediator between individuals and organizations (Stone et al., 2015).

HRM requires having more human resource tools such as open source software to meet the demands of the modern life. In the information age, IT can assist human resource managers achieve their managerial aims by analyzing information. Furthermore, evolving IT opens the horizon for HRM into electronic-HRM (e-HRM) era which includes self-service and intranet (Huang & Martin-Taylor, 2013; Lin, 2011; Marler & Parry, 2016).

### **1.2.1. Information System and HRM**

Involvement of IT in every aspects of human life has led to the need of information system as competitive advantage even in organizations (Kavanagh & Mohan, 2009). One of the key successes of each organization is robust HRM utilizing a great information system. In human resource unit, the human resource information system is used in enhancing, educating, and evaluating human resource and planning in other fields of the organization. The system collects, records, stores, analyses and retrieves data related to the human resource of the respective organization. The human resource information system, includes the following information: personal details, academic background, professional experiences, preliminary interviews, payment details, financial and legal issues, medical checkup details, complaints, record of attendance, efficiency evaluation results, duration of employment, other required details, description of the job, job specifications, description of duties and some other information that is considered essential based on the needs of the particular organization (Dorel & Bradic-Martinovic, 2011). The system is indeed a tool to archive human resource information, albeit not in a traditional and non-efficient way, rather, in a way that it is always available for managers and experts of HRM. Thus, all the required information such as the organization procedures and description of duties of the unit are included in the system. Finally, it can be easily deduced that in order to synchronize the office activities with modern patterns and to get rid of the traditional non-efficient ones, it is crucial to have a comprehensive human resource information system at hand (Mishra & Akman, 2010). Human resource information system in each department is implemented directly whereby employees can utilize such a system to manage the relevant information.

### **1.2.2. Utilization of Electronic Systems and Virtual Spaces in Human Resource Procedures**

One of the important procedures in human resource development is the recruitment and employment of the necessary human resources (Dineen & Soltis, 2011). At this age of progress, concerning the abrupt need for the skilful human resource, it is crucial to continuously be in contact with job-seekers, and have an up-to-date record of their academic and professional background. Thus, whenever there is a vacancy in a section of the organization, human resource managers would provide the required staff with minimum cost and time. To this end, it is crucial for human resource managers to render a proper space on the website for the job-seekers to submit and update information about their academic, professional and personal details. This could be done by sending messages and emails to those people and encouraging them to complete the necessary forms online (Stone & Deadrick, 2015). By means of this, the HRM could have an exhaustive list of job-seekers in hand to which they could immediately refer to extract and analyse data and accordingly hire the needed employee.

By using this method, instead of the traditional ways of advertising job vacancies in media, and printing out the employment form, as well as creating archives and keeping record of people's

information, much of the expenses of the organization would be reduced and data usage would be more efficient (Dineen & Soltis, 2011). After the extraction and analysis of the data, the selected job-seekers are invited for an interview. At this point, the experts of the human resource unit can question and examine the interviewees. Much of the examination could be carried out through online systems and virtual spaces, which in turn, could help the examiners assess the candidates' ability and skill in using computer and electronic systems. In this method, all job seekers are provided with a username and password to be informed of the results of interview and the status of their application (Dineen & Allen, 2013). Moreover, this method will not only expedite the application process by replacing the traditional modes of communication by post, but also reduce the unnecessary expenses.

### **1.3. Creation of Information Bank for Human Resource**

At this point, the primary stages of recruitment and employment of human resource have already been passed and the need for the creation of information bank for the human resources to submit their details is foregrounded (Dineen & Allen, 2013). A human resource information system is proposed by Dorel and Bradic-Martinovic (2011) comprising collection and monitoring module, record keeping, payroll module, administration of benefits, training module, performance management, and employee self-service (Dorel & Bradic-Martinovic, 2011). The modules are integrated into the human resource information system to lessen the burden on the HRM team's shoulder.

Association of new technology with human resource has opened a new horizon in the process of HRM such as e-learning, virtual recruitment, self service for employees, human resource portal, etc (Ömer, 2012). Electronic designing of the bureaucratic and organizational procedures is considered as another task of human resource information system. All the forms and guidelines must be put on the system to be available for the staff so that upon request, they could fill in the forms online and submit to the respected unit. Besides, human resource unit can notify the staff of recent changes in guidelines, news, and etc. by sending emails to all the personnel. Some of the works human resource unit is continuously engaged with are submission of leave request and reception of its results and notifying of other units; announcing the missionary assignments, appointments, promotions; issuing salary statement, premiums, and specifications; issuing premonition, promotion, and complaint notices; issuing references and other requested documents by human resource; notifying of the recent regulations and other news; online staff and service evaluation forms; forms of critics and suggestions and the follow-up of such cases; monitoring the attendance of the staff and all the other related duties that could be added to the list. By providing such services, the cost of an organization can be reduced (Lin, 2011), time can be saved (Asl, 2018a; Gardner, Lepak, & Bartol, 2003), efficiency increased (Ulrich, Younger, & Brockbank, 2008), better communication and collaboration enabled (Benson, Johnson, & Kuchinke, 2002), employees' skills improved, (Tafti, Mithas, & Krishnan, 2007), competency and knowledge management is set (Hendrickson, 2003), and human resource strategies are structured (Ömer, 2012).

## **2. Problem Statement**

Although there are many pros of advancement of new technology in enhancing HRM, some cons have appeared in using new technology in managing human resource. For instance, some of the

advantages of modernizing HRM are enhancing efficiency, saving time, reducing cost, increasing focus on employee development and so on. There is no doubt that IT has a profound effect on organizational process including HRM; nevertheless, there are limited studies which focused on the effectiveness of IT in HRM. Only few researchers focused HRM goals along with its effective factors. Therefore, there is a need to assess the impact of IT in HRM process for empowering organizations to meet their goals (Stone & Gueutal, 2005; Stone, Dadrack, Lukaszewski, & Johnson, 2015; Parry & Tyson, 2011). In line with this, this study focus on the effect of IT in optimization and transformation of HRM from traditional to modern pattern. In addition, a seven-goal-model is proposed to optimize HRM process and to enable manager to achieve their HRM goals.

### **3. Research Questions**

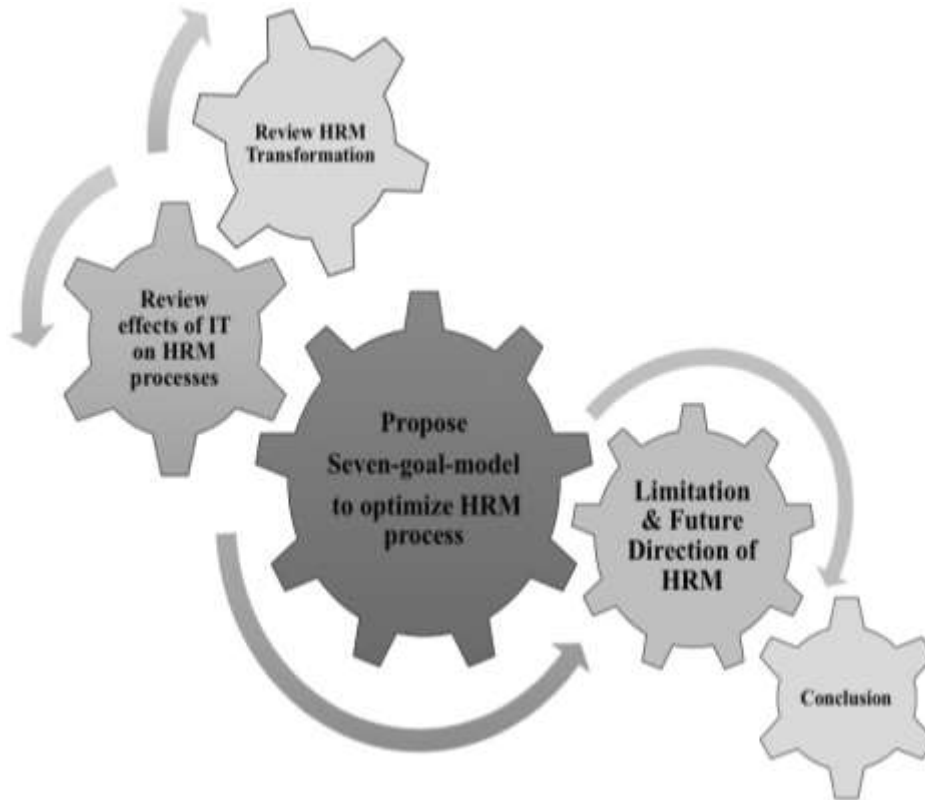
Development of IT changed HRM process from traditional to the modern pattern. Despite the speedy development of IT and pervasive its impact on HRM in organizations, it will absolutely affect HRM process in future. Therefore, this study aims to discuss: (1) HRM transformation from traditional to modern pattern, (2) Effect of IT in HRM process, (3) Optimization of HRM process in future. In order to fulfil the objectives of this paper, three research questions are inquired: (1) How has HRM transform from traditional to modern pattern? (2) How has IT affected HRM processes? (3) How can managers optimize HRM process in future?

### **4. Purpose of the Study**

Advancement of IT had a profound effect on HRM. Although effectiveness of IT in HRM was examined in existing studies, they did not provide a solution to which new systems empower organizations to achieve their human resource goals. Therefore, the primary goal of this study is to explicate the manner technological advancement has changed the direction of HRM. For this reason, this paper offers a genealogy of HRM in which HRM Transformation; traditional and modern patterns in HRM; human resource and IT are reviewed. Furthermore, this study attempts at proposing a seven-goal-model for managers to optimize HRM process in future and to enable them to reach to their human resource goals. Consequently the main objectives of this study are: (1) To offer a genealogy of HRM transformation from traditional to modern pattern; (2) To discover the effect of IT in HRM process; and (3) To propose a solution for optimization of HRM process in future.

### **5. Research Methods**

This study is a review paper which attempts to find HRM transformation from traditional to modern pattern. Furthermore, it reviews the current effects of IT on HRM processes, deliberates the existing literature on the topic, and propose seven-goal-model for managers to optimize HRM process in future. Finally, this study discusses the potential limitations and future direction on using IT to facilitate HRM processes. The process of research method is shown in Figure 01.



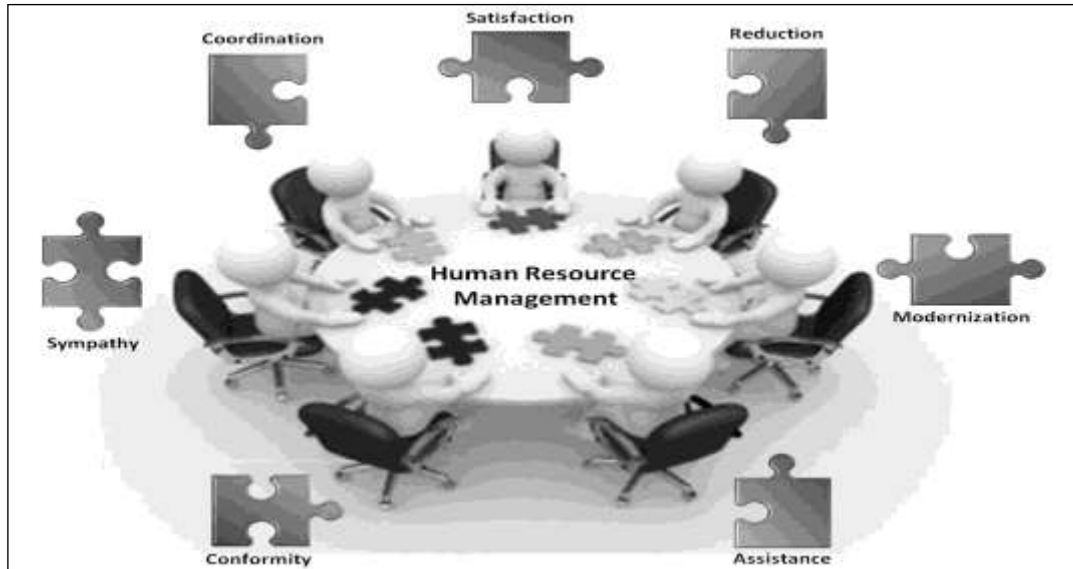
**Figure 01.** The process of research method

## 6. Findings

There are two major findings in this study which are stated as followings:

### 6.1. Proposed Seven Goals Model for Optimization of HRM

Organizations aim to attract, select, motivate, and retain talented employees to compete with other parties utilizing their employees' skills and expertise (Hall, Feldman, & Kim, 2013). HRM is considered as a social value for entrepreneurship program to address the needs of social businesses and to create opportunities for them. Rapid growth of inventions in new technologies has transformed the process of HRM in collecting, storing, using, and disseminating data related to employees and applicants in every organization. Technology-based services such as virtual team, teleconferencing, web-based applications, e-learning, e-recruitment, and so on has reduced the impact of distance on the performance of that organization (Aguinis & Lawal, 2013). In line with such services, e-learning or e-training can be initiated to enhance the knowledge, skills, and proficiency of personnel and provide efficiency, flexibility, and convenience in comparison with traditional methods. In keeping with the factors associated with the advancement of new technologies, of the significant objectives of in-service education that can assist the organization in achieving its goals, the seven goals model could be proposed as illustrated in Figure 02.



**Figure 02.** Seven goals model for optimization of HRM

As depicted in Figure 02, the first goal which is “*coordination of the staff with the organization*” is important in realizing the overall objectives, policies, and pre-determined guidelines of the organizational institute. In addition, the advancement in individuals’ vocation in the organization is contingent upon the supervisor’s expectations and the way they require the job to be accomplished. Next goal is considered as “*elevation of job satisfaction and betterment of the spirit of the staff*”. Motivating the employees to do their job is of key factors that the managers are tackling with. In order to raise the spirit of the staff and their job satisfaction, different propositions have been suggested. One of these theories is Maslow’s hierarchal pyramid that according to which the needs in the top part of the pyramid play a crucial role in motivating and elevating the job satisfaction of the employees. Thirdly, organizations aim to “*Reduce incidents and waste products*”. In many of the institutes, the vocational incidents occur due to the lack of knowledge and skill on the part of the workers. This is most true about those who work with dangerous and sensitive tools in factories. Other than those incidents, the waste products and the subsequent increase in the expenses emanates from lack of proper knowledge and skill of the workers. Hence, to avoid such incidents and the waste products and their consequences of punishment, reprimand, dismissal, and so forth that mainly happen because of lack of necessary knowledge of the policies, goals, expectations of the company, as well as lack of the required tools and machinery, it is important that the in-service training be taken seriously. The fourth goal of HRM optimization is “*Modernizing the knowledge and skill of the human resource*”. The increase in efficiency is necessarily contingent upon the increase in the knowledge of human resource and the avoidance of their knowledge being outdated. Literally, outdatedness refers to the reduction in the efficiency in a period of time as well as the lack of modern knowledge and skill. This causes the individual to be worn-out for a multiple reasons and hence unable to carry out the duties and tasks. Even though all the factors and outdatedness cannot be resolved through education, with no doubt, in-service training plays a crucial role in updating the staff by enhancing and modernizing their knowledge and skill. The next goal of organizations is to “*assist the changes and transformations in the Organization*”. The changes and



transformations that occur in an organization necessitates the preparation of the personnel and human resources. A fundamental point in organizational transformations is the employees' resistance against such changes. It is possible that the employees of the organization, for various reasons such as: concerns about success, their own position and financial status, concerns regarding their own inability in accomplishing the tasks, and etc. may oppose any changes. For this reason, other than the visual schemes to involve the employees in planning, transformation, and etc., their education is of great significance in the success towards any changes. Therefore, one of the key features of in-service training is preparing the staff for similar cases of changes and transformations. *"Conformity with the Current Social Conditions"* is the sixth goal in seven goal model of HRM optimization. Almost all contemporary organizations are working in an environment which has its own specific ideological and cultural values. The success of these organizations is contingent upon the recognition of and conformity with such specifics. The social environment of the organization, which could be called ultra-social-system, determines the domain of activity of the organizations. Hence, the realization of such a system is of great importance not only for the top managers and decision-makers but also for all the employees. Finally, organizations aspire to *"Increase the Sympathy and the Rate of Cooperation among the Staff"* as the final goal of the model. The Success of each organization, to a great extent, depends upon a state of mutual trust, understanding, and collaboration among employees, the rate of cooperation between employees and managers, and above all, the creation of unity in the way works are done in different units. It seems that one of the ways to boost the rate of sympathy and cooperation is through in-service training that on the one hand provides a common ground of interaction among employees in classes, and on the other, by enhancing their knowledge and understanding initiates a similar professional status in them. It has to be noted, however, that emphasis on any of these goals may vary according to the time and conditions, meaning that in some specific situations, some of these objectives may take greater significance. The proposed seven goals model can assist human resource department to set an apparent goal and move forward to their goal for the sake of optimizing HRM in their organizations.

## **6.2. Limitations and The Future Directions of HRM**

Although new technology brings some pros in HRM such as enhancing efficiency, saving time, reducing cost, increasing focus on employee development and so on; it reduces the quality and accuracy of electronic methods in the management of human resources (Sulsky & Keown, 1998). As current technologies use static or one-way communication, some weaknesses appear in case of e-recruitment, and that the organizations may not be able to attract a diverse talented pool and job applicants. The applicants do not have a chance of posing their queries or interacting with managers face to face even though teleconferencing is available. Hence, the current recruiting system is extremely impersonal, passive, and it creates artificial distance between organizations and applicants. However, e-recruiting increase the overall effectiveness of every organization utilizing interactive technologies (Dineen & Allen, 2013). Computer proficiency can be considered as another limitation of current human resource system. If the applicants are not capable of using computer or other technologies, the computerized test may affect on their scores and instead of testing applicant's cognitive ability, their computer skills and computer anxiety is tested as well. In spite of this, the applicants will try to improve their computer skills and be adapted with new

technologies (Keikhosrokiani et al., 2018). Necessity of computer skills affects some groups such as older applicants, ethnic minorities, and people with low socioeconomic status. There are sexual and racial differences in computer anxiety that may distress the applicant and negatively influence the performance of computerized tasks. In addition, employees prefer face to face training in contrast to e-learning system because it creates a platform for interpersonal interactions and better communication.

Indicating rapid growth of technology in the past decades, HRM process will be influenced in the future as well. Discussing the pros and cons of current HRM, its future direction can be predicted. In addition to advancement of IT, other factors such as transformation in economy, globalization, and domestic diversity impact on the future of HRM. Shifting from manufacturing to a knowledge-based economy system can change the future of human resource process. A system providing something for others or buying and selling of services can be considered as an economy system. Economists believe on dominating industrialized nation by economy systems and service activities they consider knowledge-based systems and businesses as subset of overall economy system (Andersen & Corley, 2003; Karren & Gowan, 2012). Ascending of economy systems create a new demand in the organization goals and HRM as most of the human resource processes were planned during industrial era. Thus, the traditional human resource processes that were very common during that time are no longer fulfilling the demands of new services in organizations, and organizations require talented workers for knowledge oriented jobs. These changes draw the organization attention to alter their education systems to meet new job demands in their organizations. The next factor of changing HRM process in the future is globalization in which organizations function on an international scale (Sparrow, 2007). Global environment creates some challenges for the organizations in terms of culture, language, technology, variations in social, political and legal systems. Thus, HRM teams must prepare their employees to work in a diverse environment. Cultural differences influence the gaze of people for looking and being looked in the global environment. As scholars observe “Cultural homogenization, however, necessarily involves the construction of societal stereotypes which can be overturned through practices of individualism” (Asl, 2018b; Asl & Abdullah, 2017; Asl, Abdullah, & Yaapar, 2016). Moreover, globalization can provide various opportunities for organizations such as expanding markets for products and services, enhancing creativity and innovations to be adapted with diverse culture. Organizations may plan some new strategies such as new reward systems for their workers from various cultural background to encourage and retain them for the global market (Stone & Deadrick, 2015). Apart from economy and globalization, organizations confront with some other issues such as growing domestic diversity. Organizations may face multiple generations and more ethnically diverse members with different work value, skills, attitude and behaviours; therefore, they need to change their HRM processes to meet the primary goals of multiple generations of employees (Twenge, Campbell, Hoffman, & Lance, 2010). Organizations can utilize diversity as competitive advantage to attract various talents and skills to their workspace to move forward globally; however, they require developing new HRM system to meet the need of all members.

## **7. Conclusion**

What is of great significance at the present age of progress is human resource to the extent that economists believe that it is the human resource that determines the rate of economic and social

advancement of a country and not the assets or other materials. In other words, it is the human resource that condenses the capital, exploits natural resources, constitutes social, political and economic organizations and expedites national advancements. Therefore, any country that fails to enhance the knowledge and skills of its people and fails to use it efficiently in national economy is not able to advance anything. Hence, if the employees are trained in keeping with their particular job description, they can operate more productively in the path towards advancement. In this case, the managers and supervisors would not feel the need to monitor their employees, rather they could focus on preparing them for higher and more important positions. It is after all through proper education that the employees work in a more effective and productive manner. Hence, in line with the overall objective of the organizations which is mainly to develop science and knowledge, the expert and skilful staff is pretty much required. In achieving the short-term and long-term set of goals, the necessity of capable and knowledgeable workforce is highlighted. It is also at this point that the need for constant and efficient education of the employees to obtain the highest levels of success is foregrounded.

The contemporary world is leading ahead into the future with rapid transformations. In this regard, these organizations can maintain their existence that move ahead with a similar speed. With respect to the fact that human resource is regarded as the major force of this movement, and that the waste of their time directly reduces the efficiency of the organization, the employment of modern science and electronic systems can prevent such a wasting of time and increase the rate of efficiency of the organization. Another important factor that can enhance the efficiency of the organization is the constant training of the employees. However, the cost of such in-service training seems to be too high for some particular organizations. Alternatively, and with respect to modern technological advancements, these organizations can provide their staff with virtual classes in which the respected employees can participate in their free time.

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## References

- Aguinis, H., & Lawal, S. O. (2013). eLancing: A review and research agenda for bridging the science–practice gap. *Human Resource Management Review*, 23(1), 6-17.
- Andersen, B., & Corley, M. (2003). *The theoretical, conceptual and empirical impact of the service economy: A critical review*. Paper presented at the Conference on the New Economy in Development, Helsinki.
- Asl, M. P. (2018a). Fabrication of a desired truth: the oblivion of a Naxalite woman in Jhumpa Lahiri's *The Lowland*. *Asian Ethnicity*, 19(3), 383-401. <https://dx.doi.org/10.1080/14631369.2018.1429892>
- Asl, M. P. (2018b). Practices of counter-conduct as a mode of resistance in Middle East women's life writings. *3L: Language, Linguistics, Literature®*, 24(2), 195-205. <https://dx.doi.org/10.17576/3L-2018-2402-15>
- Asl, M. P., & Abdullah, N. F. L. (2017). Circulation of the discourse of American nationalism through allegiance to consumer citizenship in Jhumpa Lahiri's *The Namesake*. *GEMA Online Journal of Language Studies*, 17(2), 54-68. <https://dx.doi.org/10.17576/gema-2017-1702-04>

- Asl, M. P., Abdullah, N. F. L., & Yaapar, M. S. (2016). Mechanisms of mobility in a capitalist culture: The localisation of the eye of (global) authority in the novel and the film of Jhumpa Lahiri's *The Namesake*. *Kemanusiaan*, 23(supp. 2), 137-159. <https://dx.doi.org/10.21315/kajh2016.23.s2.8>
- Benson, A. D., Johnson, S. D., & Kuchinke, K. P. (2002). The use of technology in the digital workplace: A framework for human resource development. *Advances in Developing Human Resources*, 4(4), 392-404. <https://dx.doi.org/10.1177/152342202237518>
- Chang, I. C., Chang, S. I., & Lee, C. Y. (2014). A study on the association of information technology risk management and business performance. *Information (Japan)*, 17(1), 59-73.
- Deadrick, D. L., & Stone, D. L. (2014). Human resource management: Past, present, and future. *Human Resource Management Review*, 24(3), 193-195. <https://dx.doi.org/10.1016/j.hrmmr.2014.03.002>
- Dineen, B. R., & Allen, D. G. (2013). Internet recruiting 2.0: Shifting paradigms. *The Oxford handbook of recruitment*, 382-401. <https://dx.doi.org/10.1093/oxfordhb/9780199756094.013.007>
- Dineen, B. R., & Soltis, S. M. (2011). Recruitment: A review of research and emerging directions. In S. Zedeck (Ed.) *APA Handbook of Industrial and Organizational Psychology*, (Vol. 2, pp. 43-66). Washington, DC, US: American Psychological Association. <https://dx.doi.org/10.1037/12170-002>
- Domingues, P., Carreira, P., Vieira, R., & Kastner, W. (2016). Building automation systems: Concepts and technology review. *Computer Standards & Interfaces*, 45, 1-12. <https://dx.doi.org/10.1016/j.csi.2015.11.005>
- Dorel, D., & Bradic-Martinovic, A. (2011). The role of information systems in human resource management. In *The role of labour markets and human capital in the unstable environment*, (Vol. 1, pp. 35-56). Ploiesti, ROM and Belgrade, SRB: Karta Graphic Publishing House and Institute of Agricultural Economics.
- Dulebohn, J. H., Ferris, G. R., & Stodd, J. T. (1995). The history and evolution of human resource management. In S. D. R. G. Ferris, & D. T. Barnum (Eds.), *Handbook of human resource management*, (Vol.3, pp. 18-41). John Wiley.
- Gardner, S. D., Lepak, D. P., & Bartol, K. M. (2003). Virtual HR: The impact of information technology on the human resource professional. *Journal of Vocational Behavior*, 63(2), 159-179. [https://dx.doi.org/10.1016/S0001-8791\(03\)00039-3](https://dx.doi.org/10.1016/S0001-8791(03)00039-3)
- Hall, D. T., Feldman, E., & Kim, N. (2013). Meaningful work and the protean career. In B. J. Dik, Z. S. Byrne, & M. F. Steger (Eds.), *Purpose and Meaning in The Workplace*, (pp. 57-78). Washington, DC, US: American Psychological Association. <https://dx.doi.org/10.1037/14183-004>
- Hendrickson, A. R. (2003). Human resource information systems: Backbone technology of contemporary human resources. *Journal of Labor Research*, 24(3), 382-394. <https://dx.doi.org/10.1007/s12122-003-1002-5>
- Huang, J., & Martin-Taylor, M. (2013). Turnaround user acceptance in the context of HR self-service technology adoption: an action research approach. *The International Journal of Human Resource Management*, 24(3), 621-642. <https://dx.doi.org/10.1080/09585192.2012.677460>
- Karren, R., & Gowan, M. A. (2012). Employability, well-being and job satisfaction following a job loss. *Journal of Managerial Psychology*, 27(8), 780-798. <https://dx.doi.org/10.1108/02683941211280157>
- Kavanagh, M., & Mohan, T. (2009). *Human resource information systems: Basics, applications and future directions*. California, US: SAGE Publications.
- Keikhosrokiani, P., Mustafa, N., & Zakaria, N. (2018). Success factors in developing iHeart as a patient-centric healthcare system: A multi-group analysis. *Telematics and Informatics*, 35(4), 753-775. <https://dx.doi.org/10.1016/j.tele.2017.11.006>
- Lengnick-Hall, M. L., & Moritz, S. (2003). The impact of e-HR on the human resource management function. *Journal of labor research*, 24(3), 365-379. <https://dx.doi.org/10.1007/s12122-003-1001-6>
- Lin, L.-H. (2011). Electronic human resource management and organizational innovation: The roles of information technology and virtual organizational structure. *The International Journal of Human Resource Management*, 22(02), 235-257.

- Marler, J. H., & Parry, E. (2016). Human resource management, strategic involvement and e-HRM technology. *The International Journal of Human Resource Management*, 27(19), 2233-2253. <https://dx.doi.org/10.1080/09585192.2015.1091980>
- Mishra, A., & Akman, I. (2010). Information technology in human resource management: An empirical assessment. *Public Personnel Management*, 39(3), 271-290. <https://dx.doi.org/10.1177/009102601003900306>
- Ömer, F. Ü. (2012). *The impact of information technology on human resource practices and competencies*. Paper presented at the 3rd International Symposium on Sustainable Development, Sarajevo, Bosnia and Herzegovina.
- Parry, E., & Tyson, S. (2011). Desired goals and actual outcomes of e-HRM. *Human Resource Management Journal*, 21(3), 335-354. <https://dx.doi.org/10.1111/j.1748-8583.2010.00149.x>
- Sohr, A., Brockfeld, E., Sauerländer, A., & Melde, E. (2016). Traffic information system for Hanoi. *Procedia Engineering*, 142, 221-228. doi:10.1016/j.proeng.2016.02.035
- Song, J., Yang, F., & Wang, L. (2017). Secure authentication in motion: A novel online payment framework for drive-thru Internet. *Future Generation Computer Systems*, 76, 146-158. <https://dx.doi.org/10.1016/j.future.2016.06.011>
- Sparrow, P. R. (2007). Globalization of HR at function level: four UK-based case studies of the international recruitment and selection process. *The International Journal of Human Resource Management*, 18(5), 845-867. <https://dx.doi.org/10.1080/09585190701249164>
- Stone, D. L., & Deadrick, D. L. (2015). Challenges and opportunities affecting the future of human resource management. *Human Resource Management Review*, 25(2), 139-145. <https://dx.doi.org/10.1016/j.hrmr.2015.01.003>
- Stone, D. L., Deadrick, D. L., Lukaszewski, K. M., & Johnson, R. (2015). The influence of technology on the future of human resource management. *Human Resource Management Review*, 25(2), 216-231. <https://dx.doi.org/10.1016/j.hrmr.2015.01.002>
- Sulsky, L. M., & Keown, J. L. (1998). Performance appraisal in the changing world of work: Implications for the meaning and measurement of work performance. *Canadian Psychology/Psychologie canadienne*, 39(1-2), 52. <https://dx.doi.org/10.1037/h0086794>
- Tafti, A., Mithas, S., & Krishnan, M. S. (2007). *Complementarities between information technology and human resource practices in knowledge work*. Paper presented at the Twenty Eighth International Conference on Information Systems (ICIS) Montreal, Canada.
- Twenge, J. M., Campbell, S. M., Hoffman, B. J., & Lance, C. E. (2010). Generational differences in work values: Leisure and extrinsic values increasing, social and intrinsic values decreasing. *Journal of Management*, 36(5), 1117-1142. <https://dx.doi.org/10.1177/0149206309352246>
- Ulrich, D., Younger, J., & Brockbank, W. (2008). The twenty-first-century HR organization. *Human Resource Management*, 47(4), 829-850. <https://dx.doi.org/10.1002/hrm.20247>
- Williamsz, T. (2006). New technology, human resources and competitiveness in developing countries: The role of technology transfer. *The International Journal of Human Resource Management*, 7(4), 832-845. <https://dx.doi.org/10.1080/09585199600000158>