A Conceptual Framework of Human Resource Technology Transfer (HRTT)

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Abstract: *HR technologies are playing a pivotal role in shaping organizational HR practices and organizational strategies. HR Technologies are helping HR functions in such a way where the HR became a decision science with a measurable impact on business results. Now the non-HR professionals are implementing HR function at ease with the help of HR technologies. As a result, there is immense use of HR technologies in both larger and smaller organizations. The hiking demand of HR technologies and its innovation requires a model for effective HR technology transfer (HRTT). Moreover, there is a strong need for making a proper balance among the applications, implementations, usages and development of HR technologies which depends on the successful and effective HR technology transfer. This paper thus proposes a model on HR technology transfer and finds out the actors and their characteristics. A better understanding of these actors and a national policy level development will help to make an effective HR technology transfer and hence the development of the HR functions and the organizations.*

Keywords: *Human Resource, Technology, Business, HRRT.*

1   Introduction

Human Resource Management (HRM) concepts and practices are continuously experiencing numerous pressures for change such as e-recruitment, e-payroll, telecommuting work system to facilitate organizational instrumental purposes and goals. HRM now becomes a major concern for the development of organizational strategy, though it was stated its role to maintain employees health and happiness only (Decenzo, 2010). The forces of globalization, diversification, technology, management thought are instigating HRM to adapt to these changes by setting new HRM direction and strategy. Ulrich (1997) thought about these changes and stated the multifaceted role of HRM and invented the concept HRM "deliverables". Now, after decades of Ulrich's research, the HRM deliverables are taking place in applied forms through different technologies and technological paradigm. These technologies of HRM (recently termed as Human Resource technology or HR technology) are also changing through the participation of different institutions and organizations. There is a slim prevalence of HRTT between organizations and society, but this has largely been suffering a number of limitations stemming from the absence of an effective HRTT framework. This research aimed to find out the actors of HR technology transfer and propose a model for HR technology transfer.

HR technology is a widely used terminology in both academic and practitioner media, though it should be called HRM technology. But, there are many organizations especially, consultancy firms providing application of HR tools termed as HR technology to facilitate decision support system (DSS) and also executive support system (ESS) (Schramm, 2006). There are also many foundations, societies and associations formed to foster

the HR applications throughout the world and also termed as HR technology (HR technology forum, UK). The common HR technologies, according to the HR technology forum are e-application form, selection metrics, performance appraisal tools, payroll tools, talent management software, ADR (Alternative Dispute Resolution), etc. HR technology can be defined as any technology that is used to attract, hire, retain, and maintain human resources, support HR administration, and optimize human resource management (BulMash, 2008). The applied HRM which are taking computer software to replenish are called e-HRM as a part of HR technology. On top of this The Forbes Magazine published an article, especially on HR technology titled "a new wave of HR technology consolidation begins". As this is a new demand for the organization and common issue in the marketplace, thus this research take the term HR technology instead of HRM technology.

The development of HR technologies and workforce analytics is helping to transform HR into a decision with a measurable impact on business results (Schramm, 2006). The expanded use of the Internet for the delivery of HR applications, especially on a service basis, is also emphasizing the importance of HR technologies for organizations. This simplified HR technology helps non-HR professionals to woks with at ease and thus getting popular among the organizations. These non-HR professionals are using those HR technologies without having HR core competencies, where there is a serious need to develop HR technology competencies for the betterment of the organization. So, there is a strong need to develop HR technologies, competencies thought a fine tuned HR technology transfer model. So, this research aimed to find out actors in the HR technology transfer and propose a model for HR technology transfer.

2   Objective of the study

The development of HR technologies and HR analytics are interlinked among the participants in a particular sector. The sharing of knowledge, technological development, organizational learning helps to foster HR technology development. The main focus of this study is to propose a model on Human Resource Technology Transfer which depicts a picture about the HR technology transfer. Besides the primary objective, the secondary objectives are 1) conceptualizing the concept of HRTT and 2) the significance of HRTT in the context of an organization.

3   Methodology

This paper takes review approach to develop a model on HR technology transfer. 53 articles and HR technology chapter of 3 books have been reviewed to justify with a point of similarity about the HR technology transfer. The articles were search through the key words of HR technology, HRM technology, HR innovations, HR trends, etc. In searching articles and chapters technology were emphasized irrespective of the country of origin. Most of the articles and books were published in developed country such as Canada, USA, where the technological environment best suit with HR technology. The articles and books were published from 1982-2017. Based on those literatures a conceptual framework has been created on HR technology transfer.

4   Literature review

Vast studies on technology transfer indicate that there has spurred a great interest about technology transfer among academic researchers and policy makers (Kofler et al, 1987, Bozeman, 1995, 2004, 2015, Choi, 1995, Akube, 2002). There is even a particular journal; the "Journal of Technology Transfer" is devoted exclusively on technology transfer and also there are enormous literatures published regularly on technology transfer in different journals and papers. Technology transfer is not only a top academic and research issue; this also becomes the important issue to the national policy makers also. Since 1980, most of the developed countries have initiated policies dealing with technology transfer (Bozeman, 2014). Though initially technology transfer was thought as an international issue to transfer knowledge and skills from one country to another, but now the domestic technology transfer is the subject for advance research and approach (Papadakis, 1994).

Though there has been a high growth of the research on technology transfer, but according to the time span, the development and growth of the research on technology transfer is not satisfactory. There are many definitional controversies led major obstacle in performing research on technology transfer (DeVore, 1987, Mitcham, 1980). Generally technology can be defined as: (1) the science or study of the practical industrial arts: (2) the terms used in a science, technical terminology; (3) applied science, according to the Merriam-Webster dictionary. But the most common view of technology is "a tool" or "a machine" which limits the boundary for the further researches. This common ground has been taken into consideration and proposed that the knowledge associated with the tools and application should be considered as technology because without knowledge base the physical entity cannot be put into use (Sahal, 1982). This research takes the definition of technology provided in Webster dictionary "study of the practical industrial art" and Sahal philosophy which are synonymous as management of HR. Based on this premise, this study initiates a new term "HR Technology Transfer" to develop in the field of HRM.

Technology transfer can be defined as the movement of know-how, technical knowledge, or technology from one organizational setting to another (Roessner, 2000). This definition is applicable to the current research, but a research on demarcating technology transfer can be conducted on to reduce the definitional controversies. A review research was conducted by Zhao and Reisman (1992) and found that the definition of technology transfer differs substantially across disciplines. They identified the definition on technology transfer from economists' perspective, sociologists' perspective, anthropologists' perspective and most common management perspective. They found that the technology transfer is more a subject for management scholars and researchers conducted research on design and production method transfer, intra-sector technology transfer, technology transfer to strategy (Laamanen and Autio, 1996; Lambe and Spekman, 1997). But there is no research conducted on HR technology transfer. Some literatures pointed out the HR issues in technology transfer (Tung, 1994), HR in technology transfer (Canningham, 1994), but such model of HR technology transfer was not established. Yet there are vivid models of technology transfer which have been initiated. The effectiveness of technology transfer model was sorted out in the extant literatures, but still there is a scope for inventing HR technology transfer model for fostering HR activities and organizational performance.

Among the technology transfer model, Boseman et al. (2014), and Choi (1994) were prominent. The best and latest effectiveness model of technology transfer was provided by Bozeman (2000) named as "Contingent

Effectiveness Model of Technology Transfer" but still lacked to serve for human resource management arena. In his research, he pointed out the dimensions of the contingent effectiveness model of technology transfer as-

| Dimension	Focus
Transfer Agent	The institution or organization seeking to transfer the technology
Transfer medium	The vehicle, formal or informal by which the technology is transferred
Transfer object	The content and form of what is transferred, the transfer entity
Transfer recipient	The organization or institution receiving the transfer object.
Demand environment	Factors (market or non-market) pertaining to the need for the transferred object.

Source: Bozeman, B., (2000). Technology transfer and public policy: a review of research and theory. Research Policy 29, 627-655.

Table 1: The dimensions of technology transfer

These dimensions are not entirely exhaustive but are broad enough to include most of the variables examined in the studies of government, studies of universities and researches on technology transfer. An effective technology transfer depends on the effective role playing of those dimensions (Bozeman et al., 2014). This research takes Bozeman actors for developing HR technology transfer and demarcating the actors role according to the HR technology transfer model.

5   Proposed model of HR technology transfer

Before 1980, the vast majority of research on technology transfer focused on cross national technology transfer specially from developed country to developing country. After 1980, USA authors were the first who took the initiative to search on domestic technology transfer (Rahm, 1992). There are many literatures on international and domestic technology transfer, which postulates the importance of HR in technology transfer and shows somehow a relevance in HR with the technology transfer. But there is no direct relationship has been established to find out the HR Technology Transfer issue. The reasons might be going on to 1) technological development and HR technologies are somehow not thought as a separate discipline to research on, 2) technology transfer encompasses too wide area that it covers HR technology transfer, 3) HR technology is confined to the software only where HRD (Human Resource Department) just buying it from the service rendering organization. But in the case of HR technology transfer, the service rendering organization develops HR technologies are based on the demand of the organization and the universities offering HR knowledge based on the demand proclaimed by the HRD of the organization. So, there are potential actors who are playing roles in the HR technology transformation or transfer. According to the contingent effectiveness model of technology transfer, this study takes the 5 actors are participating in the HR technology transfer. They are, 1) Transfer agent, 2) transfer media, 3) HR technology, 4) HR technology demand environment, and 5) Transfer recipient. The model of the HR technology transfer can be depicted as
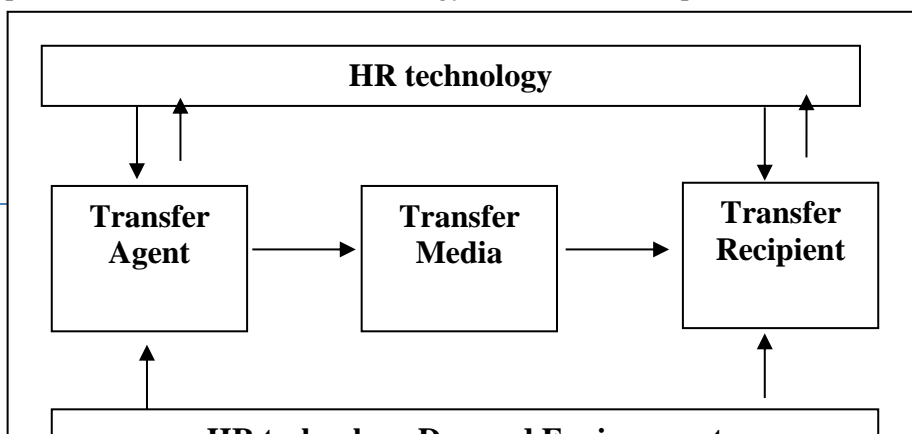
Fig: HR Technology transfer

5.1 Transfer Agent:

Transfer agents of the proposed HR technology transfer model are universities, government, private organizations, NGOs, history of the institutions, culture of the institutions, employees, independent and organizational researchers, consultants, etc. There are many researches conducted on the culture of the institutions in the technology transfer model. Much of the university technology transfer focuses on the culture of the university (Daniel, 1994, Larsend and Wigand, 1987), including the resistance of the university faculty to some of the prerequisites of proprietary work. Among the HR transfer agent government and universities are the top priorities. There is enormous research identified on the universities, academics involved in the successful technology transfer model. There are spanning researches in the universities who tend to initiate communications with firms and actively participates in the technology transfer. They engage students in the industry and participate in the research consortia, extension services, incubators and cooperative research and development. Moreover, both the public and private organization is mingled with HR problems. They are always short of the quality workforce and getting a way to maximize the output form them. These ways are transferred to others through learning, training, developing a case study, from employees and organizational in house research collaborated with external sources. The research and consultancy organizations are also performing their tasks by solving case wise problems.

5.2 Transfer Media:

The common transfer media can be the literatures, seminars, policies, licensing, contract, formal education, training, workshop, operational services, etc. Regarding public policy about technology transfer Ham and Mowery argue about the realistic public policy. To develop HR technology transfer, the government should make a public policy where there should be realistic and not distorted labor law, patent rights, contract laws, etc. Besides the government policy about HR technology, a comprehensive study was found for the transfer media those includes contact research, cooperative research, workshops, licensing, sponsored research, technical consultation, employee exchange, use of lab facilities, lab visit, and formal information seminars through publications (Roessner, 1993). There is a considerable interest growing about HR research consortium as a transfer medium (Smilor and Gibson, 1991). The role of consortium is more or less a new concept, but training for technology transfer is thought the oldest media for technology transfer. There are enormous researches found in supporting training for HR technology transfer. A wide variety of training is found from the informal training (Bozeman, 1995) to formal directed training for specialized technology transfer (Grosse, 1996).

5.3   HR Technology:

The effective use of technology is now a key determinant of successful management of human resources in the organization. The technology makes the HRM easy for the non-HR managers to have access to tools, such as computerized attendance system, e-payroll, employee database, application tracking software, web enable performance appraisal system, etc. In addition to the easiness of the HR technologies, these are also helping to save costs and increasing the quality for the organization. HR technologies provide faster services to their internal clients on a global scale, reduce the costs per transaction, provide centralized services and information that will make it easier to manage and leverage the total workforce and spend more time focusing on making strategic contribution (Brockbank and Ulrich, 2003). There are many researches found out that the companies with the complete high performing HR system with HR technology are performing better and this may be the most convincing reason for HR professionals to improve their knowledge and skills in this competency domain. Moreover, self-service technology appeared to play a role in this scenario where HR leaders made a strong effort to derive as much as value as possible from the self-service technology they implemented. The spread of the HR technology is mainly because of the lower cost and user-friendly criteria. Initially larger firms have adopted HR technologies as these were expensive as tools, but now-a-days, small firms are equally interested to use HR technologies as the software-as-service become so easy and cheap.

5.4   Transfer Recipient:

One of the important issues in the HR technology transfer model is transfer recipient. The transfer recipient can also be government agency, NGO, or a business organization. Though most of the researches show that only business organizations are recipient, but there are also well developed literatures show that government, NGO, not for profit organization also be included in the list (Lambright, 1979, Doctors, 1981). Moreover, in a study it has been found that the companies with more experience tended to be larger in terms of budgets and personnel, they were motivated by access to unique technical resources availablilty and more active in acquiring external technical information from a variety of sources including universities (Roessner and Bean, 1994).

5.5   HR technology demand environment:

The usual stereotype of demand for technology lies in two continuum, market-push and market-pull. But a strong and hidden non-market force always shape the technology demand function. There are many researches conducted and found that only 25% of the inventions received their first application in the public sector and concluded that the public sector plays an insufficient role in shaping demand conditions. So, there is always a latent demand for the technology and technological development which cannot be defined according to the market demand function. But, still in the case of HR technology it is getting popular among the users because of its simplicity and user friendly characteristics. HR technologies are now helping non-HR professional to perform HR activities in the organization. In recent year the HR applications are shifting to the cloud system. According to the survey report of the HR technology survey in USA, businesses are now recommending to restructure their strategy to make a best fit with HR technology. In their survey, they found that 44% use the cloud for HR, 30% plan to move to the could in 3 years, 40% plan to use fewer vendor, 559% see benefits of

performance management on mobile devices and 52% do not have a dedicated HR analytics team (Global HR technology survey, 2015).

6   Conclusion:

HR technology is a growing concern now-a-days and thought as a crucial facet for the success of all HR functions in the organization. There are many parties involved in the development of HR technology innovation and HR technology transfer and this will continue at a greater pace. Because of the global demand, web, e-business adoption, networking technologies, HR technology will spur and HR technology transfer will become a major concern in the HR arena, which can be a pertinent opportunity. There should be a national policy level development required for the development of HR technology transfer. Government and universities should take initiative to bring HR technology transfer into the light. There should be more research conducted on HR technology innovation and HR technology transfer cause these will be the highest demanding issues in the future. Regardless of the future, an effective HR technology transfer is likely to be a key factor in determining the success of both the HR functions and the organization.

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