

Dynamics of Knowledge Management in 4IR Through HR Interventions: Conceptual Framework



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Abstract The world economy has been remaining captive to the exponential growth of knowledge. The concept of knowledge is diversified and multidimensional which essentially includes theoretical constructs, experiential learning, incepts of laboratory results, models and of course its ability to adapt changes. In fact, knowledge economy should be ideally the fusion of indigenous belief and practice and transformation of scientific know-how. The world has witnessed rapid transformation both in society knowledge system and industrial revolution. The twenty-first century has emerged as the torchbearer for fourth industrial revolution which can manifested in designing machines, gadgets that can be embraced with auto-guided instructions, artificially par excellence with human intelligence. The aspiration of fourth industrial revolution (4IR) demands higher order of knowledge, big data analytics and continuous improvement in R&D outcomes. So, it has become emergent to concentrate on the threshold level of knowledge management practices in the transforming economy. This paper has focused on how the interrelations among the level of industrial revolution, knowledge management and transformational HRM practices include KASH protocol using conceptual modelling.

Keywords Knowledge management · 4IR · Human intelligence · Transformational HRM practices

1 Introduction

The progression of knowledge management has been carried away through a long journey. The organization began to understand that human being cannot be compared with machine as a part of neoclassical theory of management. In the beginning of

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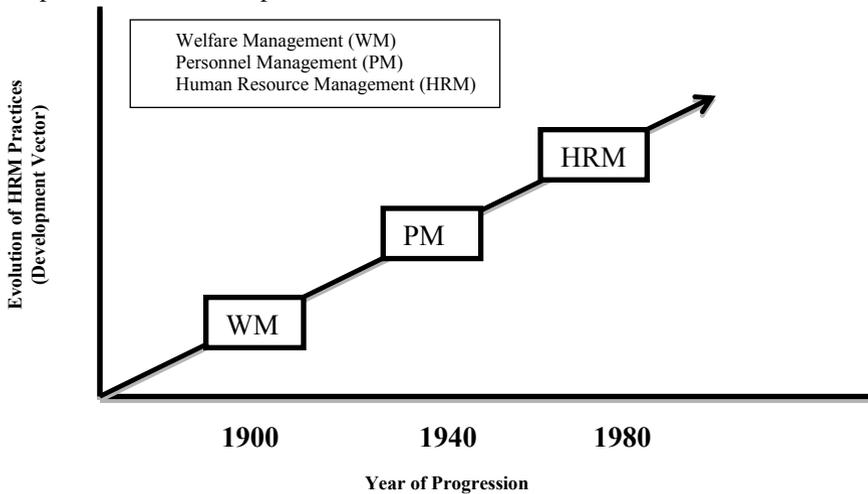
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twentieth century, the concept of welfare management had been practised by few organizations which paid a special attention on the welfare measures of workers in the factory, but the experience of welfare management practices had not been complacent as it was desired. Prior to the Second World War, the idea of personal management emerged roughly in 1940s which concentrated on measuring performance of labour on various scales, even though this school of thought never recognized the labour as human resource. The importance of training development OD interventions organizational culture climate had not been given due weightage. From 1980, the organization started to implement human resource management over throwing the erstwhile mechanistic and dogmatic view of management. HRM has been evolved as an organic orientation that recognizes and respects labour force as a dynamic resource that can be appreciated over the period of time with the augmentation of knowledge, skill and experiences. The twenty-first century has revolutionized with the advent of superior level of technological advancement. The knowledge-driven economy has been witnessing with a new paradigm, i.e. generation of new idea, product, process, with the succession of high rate of obsolescence. It becomes faster as we proceed towards the present time.



Adapted & Modified from [1, 11, 13]

With the advent, progression and popularity of 4IR, the organizations have explored to recognize the imperative of knowledge management practices at the beginning of twenty-first century. This brings the accumulation of vivid information robust technology and big data compounded with the application of AI, ML and block chain technology, etc. Today, the construct of knowledge management is not confined in accumulating functional super specializations rather it has extended to endless interactions among various dataset from various domains in a multi-varied assortment of knowledge basket with multi-criteria decision-making (MCDM) protocol [14]. This envisages numerous innovative opportunities and new directions that lead to explore knowledge-led dynamic problem-solving mechanism.

1.1 Evolution and Understanding of Knowledge Management

Contemporary business writings have extensively focused on knowledge management and have curated it as a contemporary theoretical discipline and shifted the focus of organizations from tangible products and goods to intangible assets focused on performance and profitability in this competitive environment. Knowledge management has opened up the opportunity to add renewed strategic growth in any business organization [2]. A study ‘Emerging Practices in Knowledge Management’ conducted by the American Productivity and Quality Center of the USA points out six key strategies of a firm for practice of knowledge management (KM). From a business strategy point of view

1. As a tool to transfer best practices.
2. As a customer-oriented tool.
3. As discipline for personal development.
4. As a tool for intellectual assets management.
5. As a tool for knowledge creation and innovation.

Prominent fortune 500 companies like ‘Dow Chemicals’ and ‘Texas Instruments’ were also a part of this survey [6]. KM focuses on gathering of useful knowledge or for the business process so that the employees can readily access knowledge. It also helps to secure specified well-defined set of knowledge practice by preventing from use of inappropriate knowledge. KM is research intensive and involves application of organizational learning capacity over competitive advantage in the long run. Evolution of KM intervention can be categorized into six broad stages which can be further rationalized as depicted below.

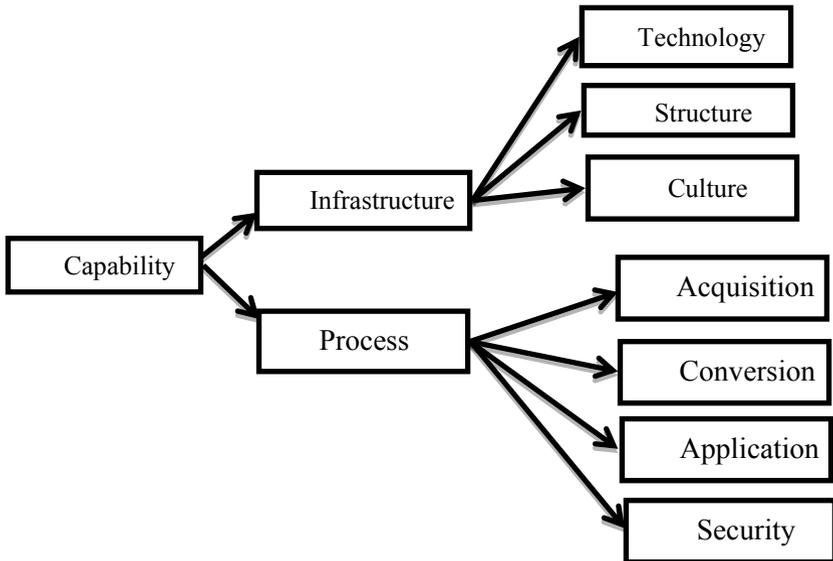
Six broad stages	Rationalization of stages
Initiation	KM initiation
Adoption	
Pilot implementation	
Organic growth	KM development
Organizational implementation	
Diffusion	KM maturity

The factors determining the evolution of KM are classified into knowledge self-efficiency, open communication and mutual benefits [4]. The example of companies like Dow Chemicals which is a treasure trove of unorganized intellectual property, whose main business is to earn royalty through licensing of technology and information highlights the importance and needs of knowledge management in order to organize this other wise piled up disorganized knowledge for profit maximization [6].

1.2 Dimensions of Knowledge Management

The knowledge management can be referred in two perspectives, i.e. in terms of capability dimensions and quality ontology. The capability dimension can be broadly categorized into two sub-dimensions, i.e. infrastructure and process. The attributes of infrastructure may include technological led ecosystem, other resources and support facilities structure, culture. The process matrix may comprise acquisition, conversion, application and security. This has been illustrated in the figure mentioned below:

Capability dimensions	Attributes	Meaning
Infrastructure	Technology Structure Culture	Organize fragmented knowledge in an organization Leverage of technological architecture Encouragement of employee interaction
Process	Acquisition Conversion Application Security	KM process of knowledge acquisition Utilization of the existing knowledge Application of knowledge Knowledge protection



This matrix model helps identify the capability dimensions of knowledge framework and its subsequent branch entities [3]. A conceptual frame work is proposed to manage the quality dimensions of KMS based on the environmental factors and its effects on the same. The resultant framework consists of 36 items grouped into the eight dimensions of KM namely Functionality, Completeness, Reliability, Usability, Access, Serviceability, Flexibility, Security [7, 9].

1.3 Knowledge Management Is an Extension to HRM?

The spectrum of innovation has immensely expanded the ambit of HRM capabilities. The incidence of continuous innovation in every filed of HRM like selection, performance management, training & development etc. has made phenomenal changes to bringforth new directions and domain of thought processes as outcomes that are assimilated in the organizational ecosystem and practiced by the successful mediations and interventions of KM by means of development, dissemination and application of knowledge [8]. Collaborative and holistic practices of KM-induced HRM essentially enhance the uniqueness of organizational competency preferably the knowledge protocol, which positively signifies the association with the extent of innovations not the other way around, i.e. knowledge HRM (KHRM) has no impact on innovation excepting to mediate between collaborative HRM as transformational change agent [5].

1.4 Knowledge Management in the 4IR

There is symbiotic relationship between knowledge management and the progression of 4IR. The fourth industrial revolution has been continuously expanding the knowledge sharing platform so that it can move forward endlessly in consonance with the rapid research and development outcomes. From the beginning of twenty-first century, the world of technological research largely dominated by splendours of electronic gadgets, IoT, machine learning, block chain technology which facilitates to generate record process and interpret the large volume of data which is popularly known as big data analytics which primarily solve the problem by means of various modes of descriptive, predictive and prescriptive data analysis. All these development vectors in the technological framework and high yield application mechanism to solve complex problems have essentially deserved the transformative knowledge management initiatives in the organizational set-up.

2 Objectives of the Study

1. To propose a logical model to understand the interrelationship between progression of industrial revolutions ab initio and individual firms' aspirations for bridging knowledge gaps.
2. To develop a conceptual framework for understanding interrelations and interactions among industrial progression (4IR), knowledge management and transformational HRM practices using HRM competency model.
3. To devise the knowledge-dominated KASH protocol in HR interventions in congruence with the progression of industrial revolution.

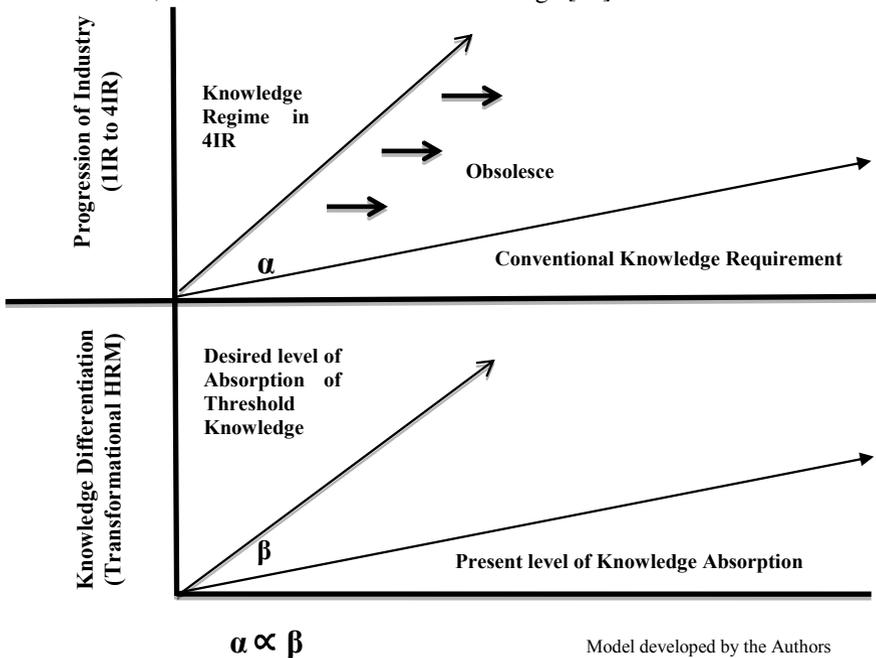
3 Research Methodology

This is an exploratory study through which it is attempted to understand the premises and fitness of knowledge management in the emerging 4IR ecosystem. The paper has been designed referring various research papers, reports and suitable application of strategic evaluative protocols widely practised in the academia and the research world.

4 Analysis and Interpretation

4.1 Analysis & Interpretation—I

According to Watson [12] knowledge is regarded as an ability to utilize information in order to add value and influence the decision-making process. It is imperative that the organization should adapt the terminal level of knowledge in a useable form so that there should not be much deviation of standards between industry and firms in terms of creation, transfer and utilization of knowledge [10].



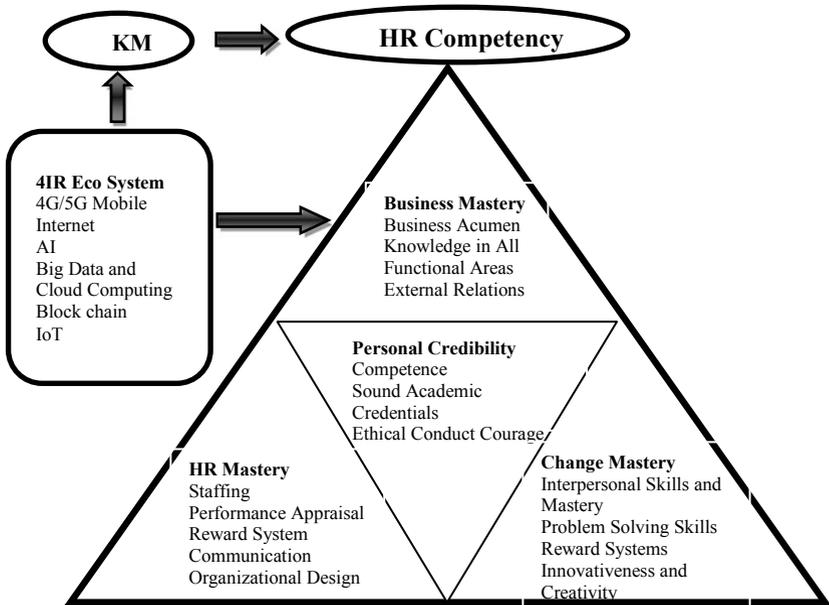
Model developed by the Authors

The journey of industrial revolution has been largely manifested by the voracity of knowledge which has emerged through the continuous process of innovation. In the comparative two-dimensional matrix, the angle (α) between conventional knowledge requirement and knowledge regime in 4IR increases with the fact that

'knowledge regime in 4IR' would tend to incline to Y-axis with the passage of time. Similarly, the angle (β) between the 'present level of knowledge absorption' and the 'desired level of absorption of threshold knowledge' must escalate in proportionate with the time spend and experience gathered. For every organization to survive in the dynamic environment and technological development, the angle α and β must be proportional and highly correlated in order to signify that the organization would remain competitive as it enjoys competency in the incremental knowledge-dominated industrial revolution. If the organization fails to achieve this synergy, it would literary cease to exist. The upsurge of 'knowledge regime in 4IR' tends to incline towards Y-axis which makes the curve stiffer enhancing the value of angle α . As a result of that, it forces to dissociate the previous knowledge set to become obsolete as depicted in the model.

4.2 Analysis & Interpretation—II

The progression of knowledge intends to augment the process of industrial revolution (IR). The set of ongoing innovations essentially land up with a new age and phase of IR; thus, human society moves forward from the primitive era of IIR to the most advanced knowledge-driven industrial revolution popularly known as Industry 4.0. The industrial environment essentially influences the appropriate inducement of knowledge that can generate higher order of competency uniqueness for the firm. In order to explore these opportunities, the firm needs to invest on high-end resources as well as procurement of superior human resources that can augment and transform the change management initiative at possible encounter. The new era of knowledge management imbibes the HR policies to encourage and promote the best talents to acquire so that the culture of learning organization can perpetuate with higher acceleration as in tune with the expectations of the relevant industry.

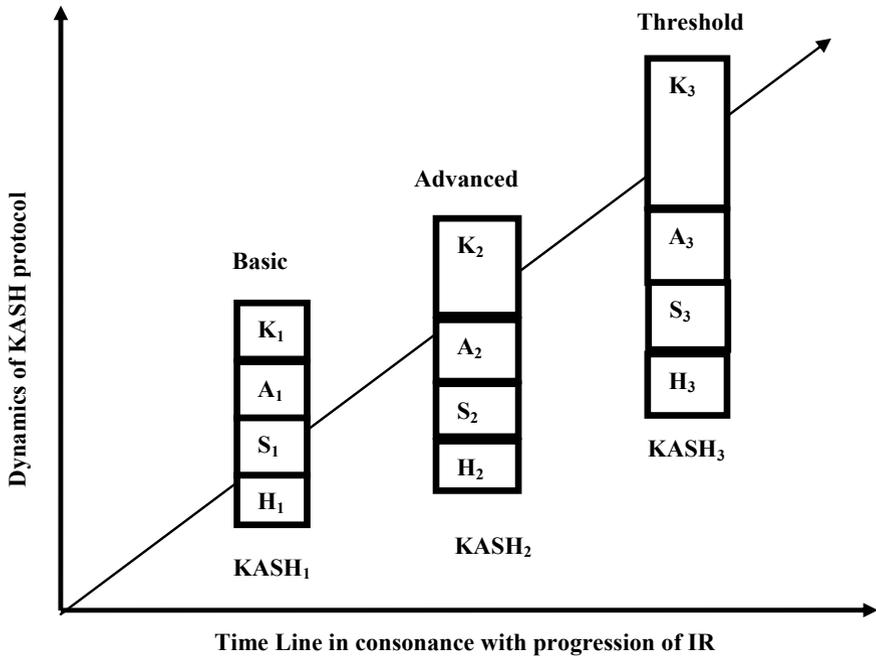


Model developed by the Authors in corporation HR Competency Model adapted from Human Resource management by Christopher Maybe, et. al., Blackwell Business, p.31

The model has been developed to project how the industry environmental factors reign enforces the firm to prioritize knowledge management which can be trickled down even at the bottom of the pyramid in the organizational hierarchy. This holistic development vector has to be inundated by the dynamic HRM practices as depicted above.

4.3 Analysis & Interpretation—III

The basic function of HRM revolves on its effective strategies human resource planning, performance management and human resource development which also interacts and correlates each other. One of the important approaches to address the HRM functions may be the successful manifestations of Knowledge, Attitude, Skills, Habits (KASH) protocol.



Model developed by the Authors

KASH denotes the assortment of four components: Knowledge (*K*), Attitude (*A*), Skill (*S*) and Habits (*H*) which are primarily required for a certain position of an organization in a mutually exclusive manner. KASH differential matrix examines the differentials of each component with respect to the deviations from the actual level of performance from its desired/expectancy module.

The firm always looks at the KASH differential matrix as illustrated below.

KASH components	Desired KASH set	Actual KASH set	KASH differentials (D~A)
Knowledge (<i>K</i>)	K_D	K_A	$K_D - K_A$
Attitude (<i>A</i>)	A_D	A_A	$A_D - A_A$
Skills (<i>S</i>)	S_D	S_A	$S_D - S_A$
Habits (<i>H</i>)	H_D	H_A	$H_D - H_A$

~ Sign of difference

If ($K_D < K_A$) or ($K_D = K_A$), i.e. the knowledge set desired is either lesser or equal to the knowledge possessed by the existing professional, no training need is identified / required. In general cases, K_D happens to be greater than K_A that means, the desired knowledge is greater than the actual knowledge possessed by the concerned employee that symbolizes the specific requirement of knowledge, i.e. identification of training need on specific knowledge domain. The firm would attempt to minimize the [$K_D - K_A$] by means of appropriate HR interventions. Similarly, other **KASH** components can also be described. The most feasible 'K', 'A', 'S', 'H' combinations are generally encouraged for achieving desired HR objectives. With the growing influx

of knowledge management, the appropriate '**KASH differential matrix**' needs to be formulated, giving increasing weightage on knowledge components as per the dynamic demands of 4IR and so on.

5 Conclusion

Experiential learning and Research & development generate new idea product process for the welfare of mankind. The benefits of such illustrious development can reach to the people if it is implemented effectively and efficiently. It is a turn for the industry in general and the firm in particular to adapt such changes by augmenting advanced knowledge management protocol. The transformation process needs appropriate HR interventions that can only ensure this transition in an accelerated change management initiative. This paper has presented conceptual framework to understand the interrelations and interventions of KM and transformational HRM through along the progression of industrial revolutions more precisely 4IR ecosystem.

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