

HUMAN RESOURCE INFORMATION SYSTEMS, HUMAN RESOURCE PRACTICES, EMPLOYEE ENGAGEMENT AND EMPLOYEE PERFORMANCE

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ABSTRACT

Human resource management is becoming complex with the influx of artificial intelligence and machine learning in Industry 4.0. There is an increasing trend of deploying IT to HRM in the form of HR analytics, HRIS, and so on. The current study is directed towards studying how Human Resource Information Systems (HRIS) have resulted in a digital transformation of HRM practices and its indirect impact on enhancing employee engagement and performance. Data was collected from four public sector undertakings from Odisha, and a survey questionnaire was administered to them. The first part of the two-part questionnaire consisted of demographic questions, and the second part consisted of 56 forced-choice Likert-type questions. Confirmatory factor analysis and structural equation modelling were attempted using SPSS 23 and AMOS 18 for hypothesis testing. The results of hypothesis testing showed a significant effect of HRIS implementation on HR practices and Employee Engagement, which in turn was found to have a significant impact on Employee Performance.

Keywords: Human Resource Information Systems, HRIS, Digital Transformation, HRM practices, impact, Employee Engagement, Employee Performance.

INTRODUCTION

Today's market environment can be characterised by high competition and fierceness. As a result, to survive this competition, organisations are striving to change their primitive way of functioning. In this regard, only those organisations can survive that are keen on adapting to new technologies and functions can enhance effectiveness and performance. Nonetheless, employees are considered the key asset of any organisation as they not only help them in attaining their goals and objectives but also help in attaining a competitive edge in the market. The ideal efficacy and efficiency of an organisation are defined not just by its financial resources or by employing the best strategy, but also by the extent to which and how it utilises its human capital. Thus, in any organisation, it is the responsibility of the human resources management team to ensure that the organisation is optimally utilising as well as recruiting and retaining the best employees. Moreover, Human Resource Management (HRM) plays a key role in ensuring that these assets are working in alignment with the specific needs of the firm. However, the manner in which the HRM used to operate previously is not viable in ensuring the survival of the firm in this fierce competition. Consequently, due to globalisation and rapid advancement in technology, there is a significant digital transformation in HRM practices. The unsuitable conventional HRM practices have been transformed by Information technology (IT), and thereby, their manual functions have now been transformed.

Silva and Lima (2018) highlighted that in the face of digital transformation, every aspect of society is experiencing a digitised shift. Human Resource Information System (HRIS) is one such system where the digital transformation of conventional HRM practices has been done to improve its efficiency. In accordance with this, Stone et al. (2015) outlined that there are a number of issues that prevail in the current HRM functions, which have resulted in the need for this digital transformation of HRM practices. These issues comprise the utilisation of parallel communication systems that are impersonal and passive, a lack of interpersonal interactions and the development of an artificial bridge between the employees and top management. However, there are many factors that affect the adoption of HRIS as well.

The current study aims to outline how the digital transformation of HRM practices in the form of Human Resource Information Systems (HRIS) will impact Employee Engagement and Performance levels. To accomplish this purpose, the study strategically reviews the existing literature and contemplates theoretical as well as practical evidence for the goal of the study.

LITERATURE REVIEW

Al-Dmour et al. reported that perceived benefits for the firm, compatibility with organisational objectives, complexity, the commitment of the management, experience of managing IT and social & technology skills are some of the internal factors that affect the adoption and implementation of the HRIS in the organisation. Subsequently, external variables influencing HRIS adoption and deployment include the availability of IT vendors and activities, competition pressure, social effects, and government regulations and assistance. Moreover, the success of HRIS is impacted by several barriers. These barriers are outlined by Jahan, as inconsistency in the high significance placed on HRIS results in difficulty in maintaining the commitment of the top management towards the venture and acquiring the materials required to completely create an advanced or improved system of human resources. Additionally, it is also found that the management often underestimates the complexity of the HRIS and its influence on organisational behaviour and procedures. Finally, when the organisation has a lack of human resources that can adapt and operate HRIS affects its adoption and successful impact for the firm. We frame our first hypothesis as follows:

H₁: *HRIS significantly affects Human Resource practices.*

Human Resource Practices in Organisations

Human Resources plays a significant role in the organisation for enhancing employee performance, ensuring employee well-being, development, and many other aspects. Thus, the sections below seek to unveil the role of HR when their practices are digitally transformed. The sections aim at primarily deriving the role and importance of HR practices in the organisations; further, the concept and importance of HRIS; the concept of employee engagement and its eminence; the implication of HRIS with regard to employee engagement; and lastly, the crucial interplay between HRIS, employee engagement, and employee performance.

Human resource management is the backbone of any organisation that ensures that the wheel of the organisation is running at a constant pace with no or minimal disruptions. Human resource management is responsible for providing an effective chance for employees to outline their expertise and the organisation to utilize this expertise for their goals. In many organisations, HRM is the key department that looks after the safety and risk mitigation measures, ensures

employees are motivated, trained to accomplish a given task, have a seamless communication process, and deserving employees are recognized and rewarded. Consequently, the HRM is also found to perform various other functions like recruiting and selecting potential employees which help to accomplish the needs of the firms. It is also conducive to creating a set of clustered rules for the managers that will help them in making pertinent decisions. Additionally, Hadi et al., (2019) suggested that gauging and uplifting the performance of the employees is one of the key functions of HRM policies. Mirzapour et al. outlined that in the case of organisational crisis, HRM policies and practices not only help in averting the panic faced by the employees but also motivate them in uplifting their performance. Maryam et al. illustrated similar findings with regard to the role of HRM in averting crises at a global level. Zardasht et al. (2020) also highlighted that HR's functions of motivating, communicating, empowering, rewarding, and training have a significantly positive impact on the job satisfaction level of the employees.

H₂: *Human resource practices have a significant effect on employee engagement.*

Human Resource Information Systems (HRIS)

Employing firms and their working environments have gotten increasingly complex in today's global society. Managers of such firms face challenges in dealing with employees from many nations, cultures, and religions. Taking into account such proclivities, the conventional HR process management seems to be completely inadequate. To ensure the success of the business, all HR professionals and organisations must be familiar with the HRIS and its applications. Nonetheless, it is a difficult topic for IT/IS research to comprehend why individuals accept or shun information technology.

Human Resource Information Systems (HRIS) can be delineated as a method that can be utilised for attaining, storing, controlling, recovering, and distributing relevant information regarding human resources. According to Silva and Lima, HRIS can help in a three-fold manner and thereby contribute to the overall effectiveness of the organisation. Firstly, in the case of HR professionals, HRIS can play a viable role in accomplishing job responsibilities like reporting, management of payroll, compliance, analysing performance, recruitment of new employees, and skill development. Secondly, with regard to functional managers, specific goals and objectives of the firms can be attained. For instance, the HRIS can help them in providing accurate insights into performance appraisal, its management, team management, coordination of projects, hiring and attrition, training and development, and so on. Thirdly, employees are also the end-users of the HRIS applications as they can browse through career planning, training and development activities. Moreover, employees can also understand the manner in which their performance is being gauged and thereby, it promotes better transparency between the employees and the management.

Similarly, Teotia in her study concisely suggested some rationale for which firms should employ HRIS. These reasons are related to the following aspects of HRIS's contribution to organisations:

1. Increasing competitiveness by advancing and expanding HR operations
2. Creating more detailed HRM reports,
3. Changing the function of the department to “Strategic Human Resources Management” (SHRM) from HRM,
4. Revamping the organisation's entire HRM division

5. The ability to employ HRIS to assist strategic decision-making operations, programme and policy evaluation, or day-to-day operational concerns.

Olson et al. (2018) discovered that there is a relationship between the use of online technology and organisational agility, which is the capacity of an organisation to adapt to changes in the external business environment. The use of e-HRM enables organisations to monitor changes in the external business environment, particularly in labour markets, and to hire competent personnel who can assist in adjusting to changes in competitive marketplaces. This is an essential factor since adaptability to change has been linked to organisational profitability and competency. Further, Khashman & Khashman, (2016) in their study outlined that the advantage of HRIS is not just limited to accruing information about the employees, but it is also a viable mechanism through which skilled employees can be retained. Moreover, the study states that the system of HRIS is highly conducive to firms that are large and cannot effectively track as well as monitor the performance and efforts of the employees that are employed at different levels, different departments, and different branches of the firm. Thus, it allows cross-sectional evaluation of the employees and departments that majorly contribute to the success of the firm.

Employee Engagement

William Kahn created the phrase "personal involvement" in 1990. He described personal engagement as employees' desire to be completely immersed in their job and so be physically, intellectually, and emotionally involved throughout role performances. Bakker defined engagement at work as a psychological state in which an individual executing a job task is totally immersed in it with high energy and excitement levels. Work engagement is often recognised as the primary determinant of an organisation's competitiveness and success. This is because engaged individuals are more likely to display a desire to put in additional effort at work and, as a result, achieve peak performance.

Work engagement, according to Schaufeli and Salanova, is described as a positive state of mind possessed by an individual for completing work-related activities that are marked by energy, devotion, and absorption. When working, vigour is characterised by strong levels of energy and mental resilience. It represents the desire to focus one's energies on one's task and persevere in the face of adversity. Dedication may be defined as a significant interest in one's job, resulting in a sense of significance, passion, inspiration, pride, and challenge. Finally, absorption might be defined as the state of having complete focus and being content to be absorbed in one's task. As a result, such people truly believe that their time is passing by and have a more difficult time disconnecting themselves from their work. As a result, engaged workers are more likely to be hard workers, thoroughly invested (committed), and highly captivated (absorbed) in their jobs. As a result, high levels of employee job engagement are an important factor in improving the organisation's and workers' productivity and performance.

Kim and Park in their study highlighted that organisational procedural justice shares a strong positive association with the work engagement levels of employees. It also has a direct positive impact on knowledge sharing and innovative work behaviour. Employees portraying prominent levels of work engagement level tend to be innovative and enable knowledge sharing with other employees. Similarly, Christensen et al., in their study, analyzed the impact of job resources available on the engagement of teachers and further, its impact on academic productivity. The study stimulated that lack of work engagement along with administrative issues and lack of technical support for research and teaching had an adverse impact on the academic productivity of the Norwegian University.

Employee engagement is a significant function of boosting employee motivation levels. In addition to this, it predicts the extent to which an individual is inclined towards directing their unconstrained efforts for attaining organisational goals and ensuring success. Such employees are found to pay more attention, work for extended hours and exert discernible efforts over and above what they are expected. Employee engagement has a favourable impact on the performance of organisations. Such employees are also found to be highly loyal, productive and innovative in their approach as they tend to plan in advance for the attainment of organisational goals. Hanaysha, conducted a study that aimed at examining the influential role of work engagement in leveraging employees' productivity levels. The study collected primary data from 242 employees with the help of an online quantitative survey. The study's findings channelized that the engagement of the employees at work had a significantly positive impact on their productivity.

The implementation of IT in Human Resources not only guarantees an increase in the performance outcomes of the employees at a micro level but also at a macro level, it has the capability to increase the profitability of the organisation. Arefin and Hosain et al. (2020) through their study affirmed that the implementation of HRIS in the pharmaceutical industry of Bangladesh had a positive impact on its profitability. The study analysed the implementation of HRIS into four core HRM functions of job analysis, recruitment & selection and organisational, performance appraisal and communication. Findings elucidated that adoption of HRIS into these core functions had a significantly positive influence on the productivity of employees which aggregately did increase the profitability of the industry Hosain (2017).

Impact of HRIS on Employee Engagement Level

The utilisation of technology in manual HR practices in the form of HR analytics or HRIS applications allows the HR department to conduct more proactive and accurate analysis of employee information. It is often observed that employees perceive that performance appraisal practices of the HRM are biased and inaccurate. However, the application of the HRIS mitigates these perceptions of the employees about the process of performance appraisal and builds a sense of confidence in the appraisal process. As a result, a high level of perceived accuracy and fairness in the process will improve the willingness of the employees to enhance their performance outcomes. This, in turn, will increase the overall satisfaction and engagement levels of the employees with regard to their jobs.

Oladipupo and Olubusayo (2020) aimed at analysing whether the adoption of HR analytics attributes can play a conducive role in enhancing the engagement level of the employees. The results showcased that HR analytics play a vital role in contributing to the degree of which employees are betrothed. The study accentuated that HR analytics impact three emotional engagement, cognitive engagement, and behavioural engagement which aggregately improve their overall employee engagement in the manufacturing industry. A similar study was conducted by Jayabalan et al. in the education sector of Malaysia. The study specifically gauged how the integration of HRIS application in conventional HR practices can help enrich the overall engagement level of the employees. The findings elucidated that the integration of the HRIS system into performance management practices of HR is not very instrumental in enhancing employee engagement levels. On the contrary, integration of HRIS into other HR practices of training & development, job design & redesign, and reward management does have a significant hand in leveraging the employees' level of engagement.

As opposed to the above studies, research conducted by Juma, delineated that HRIS shares an insignificant association with employee engagement level when the organisations fail to employ

the requisite technologies to enable appropriate functioning of the HRIS systems. Furthermore, the study showcased that support from the top management is crucial in allowing organisations to embrace the benefits of HRIS implementation. Without appropriate support from the top management, HRIS implementation will not result in increasing the overall efficiency of the firm or improving the HR planning and development processes that are directed towards enhancing the performance and engagement levels of the employees.

We postulate our second hypothesis as follows:

H₃: *HRIS has a significant effect on employee engagement.*

Employee Engagement on Employee Performance

According to a study conducted by Saxena and Srivastava, employee engagement was found to be strongly correlated with organisational culture, open communication with supervisors, superiors' empathetic attitude toward employees, acknowledgement of one's initiatives to organisational goals, providing a scaffold for showcasing ones' view in taking decisions for the growth of the firm, highlighting measures of safety, and HR policies that are crucial for the retention and overall productivity of the employees like adequate training, appropriate monetary and recognition benefits, and so on. As a result, when employees are more loyal, turnover is lower, and performance and productivity are higher. Furthermore, Al-Dmour, in their study aimed to examine the implication of utilizing HRIS applications on the performance of the employees and thereby, the mediating role played by employee engagement in the specific case of five-star hotels of Jordan. The study's outcomes confirmed that the implementation of HRIS requires HR employees to be more alert, and responsive, and offer more precise details. Moreover, HRIS helps in facilitating these employees with greater autonomy in handling this information. Finally, it was revealed that employee engagement does mediate the association between HRIS implementation and the performance of the employees.

The beneficial impact of HRIS is not just limited to HRM alone, rather it offers greater benefits for the organisation as well by improving the overall performance of the organisation and thereby, its efficiency. A study conducted by Kaygusuz et al., surveyed 160 senior managers, mid-level managers and employees from the industrial and banking sectors of Istanbul. The findings of the study that the implementation of information systems for carrying out HRM processes in organisations can effectively result in increasing the efficiency of the organisation. Moreover, it increases the overall performance of the employees. Furthermore, Kaygusuz et al. also state that the implementation of HRIS may have a positive impact on employee commitment. This is mainly due to the fact that employees may feel they are being assessed by a fair and objective system, and their conviction in such a system may boost their organisational commitment and dedication to the job at hand.

While many studies have estimated the impact of HRIS adoption on employee engagement, a study conducted by Moussa and El Arbi, aimed at assessing the impact of employee commitment levels on the association between HRIS and the innovative capability of the employees. The findings of the study confirmed that the usage of HRIS has the ability to uplift the overall innovative capability of HR employees. Furthermore, employees' emotional commitment has been observed to influence the association between HRIS utilisation and individual innovation potential. In fact, the more the employees' emotional engagement with their firm, the greater the HRIS influence on the individual innovation behaviour of HR professionals. The research provides for the delineation of specific lines that are responsible for increasing individual creativity. Thus,

aggregately contributing to the overall performance of the organisation. We postulate our fourth hypothesis as follows:

H4: *Employee engagement has a significant effect on employee performance.*

The hypotheses are diagrammatically presented in Figure 1.

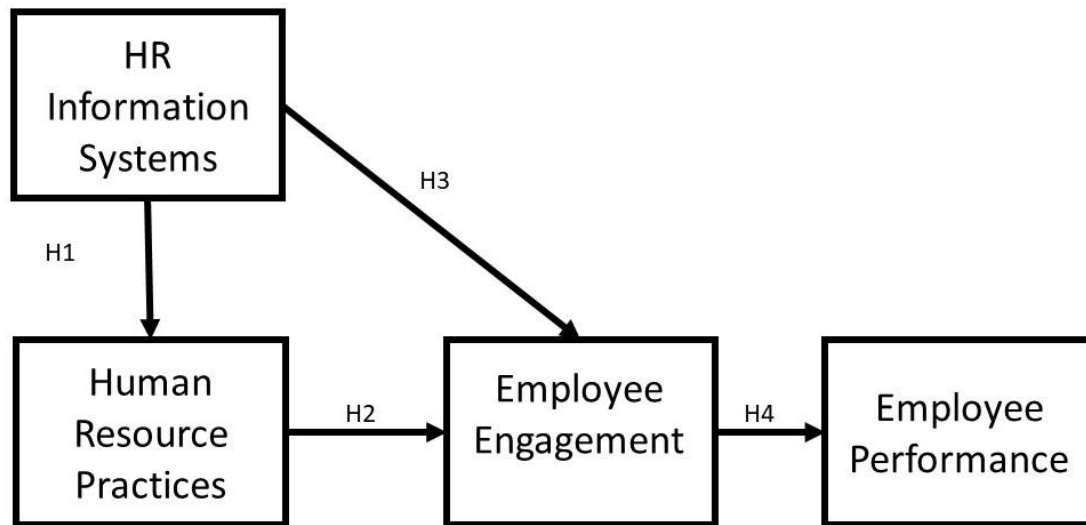


FIGURE 1
CONCEPTUAL FRAMEWORK OF RESEARCH
METHODOLOGY

Sampling Unit, Sampling Process and Sample Size

The study explores the HR practices, HRIS implementation, employee engagement and employee performance in select PSUs in Odisha. Data was collected from the employees of four PSUs, namely, Odisha Power Transmission Corporation Ltd. (OPTCL), Odisha Mining Corporation (OMC), Odisha Hydro Power Corporation (OHPC) and National Aluminum Company (NALCO) in Odisha, India. Individual employees were taken as the sampling units. Simple random sampling was adopted as the sampling process. A total of 500 employees were randomly selected from these four PSUs and were administered the questionnaire survey. Certain thumb rules are provided in the literature and statistical texts for deciding the sample size. Field states that 10-15 subjects per variable are desirable, while Habing states that one should have at least 50 observations and at least 5 times as many observations as variables. In this study we have used 56 variables, the sample size of 500 is approximately 9 times the number of variables, which is sufficient and adequate.

Scales

HRIS Scale: This study uses a sixfold scale comprising perceived HRIS system quality, perceived HRIS information quality, perceived HRIS ease of use, perceived HRIS usefulness, HRIS

satisfaction, and HRIS success to evaluate the HRIS implementation. A total of 18 questions three for each of the HRIS dimensions were used.

HR Practices Scale: This study uses the public HRM practices scale (public HRMPS), composed of 19 items, distributed along four factors/dimensions, named training, development and education; relationship; work conditions; and competency and performance appraisal.

Employee Engagement: Employee engagement was measured by the Utrecht Work Engagement Scale (UWES-9). This scale comprises nine questions.

Employee Performance: Employee performance comprises two questions each on meeting deadlines, teamwork, creativity, mentoring juniors and ethics.

Survey Questionnaire

The PSU employees were contacted and the information was collected using a questionnaire which comprised of two parts. Part one contained questions pertaining to demographic details while part two contained 56 Likert-type questions measuring the HRIS implementation, HR practices, employee engagement and employee performance. The questionnaire included forced-choice questions with a seven-point Likert scale. In this scale, 1 stands for most strongly disagree, 2 for strongly disagree, 3 for disagree, 4 for midpoint or can't say, 5 for agree, 6 for strongly agree and 7 for most strongly agree to the premise in the question item.

The questionnaire was pilot-tested on 37 PSU employees for the suitability and ease of understanding of the questions. The questionnaire was modified following the responses of the pilot survey with the help of subject experts. The modified questionnaires were administered to the employees.

Preliminary Testing of Data

The collected data is coded and fed into SPSS 23 software. A number of tests are applied to ascertain the suitability of the data for further statistical analysis as described below:

Missing/Incomplete Data

Out of the 500 respondents, 403 responses were found to be complete and usable for analysis. This translates to approximately 80% which is reasonably good and is due to the controlled method in which the data was collected from the respondents.

For statistical analysis of data using parametric tests, the data must conform to the normality of data, homogeneity of variance, independence of observation and interval data. The results of such tests are presented below-

Test of Normality

The test of normality is a necessary condition for the data to be analysed using parametric statistical methods including factor analysis. The normality of data was tested using the skewness and kurtosis values and also by P-P plots. Skewness values within ± 1 and kurtosis values under 3 are taken as normal. However, West, Finch and Curran proposed a reference value of absolute skewness value of greater than 2 and a reference value of absolute kurtosis above 7 for substantial departure from normality. The survey data returned acceptable values of skewness and kurtosis.

Test of Homogeneity of Variance

Levene's test is applied to test the homogeneity of variance, which confirms the homogeneity of variance.

Independence of Observations

As the survey was completed by the respondents independently the independence of observations was maintained.

Use of Interval Scale

Use of five or higher point Likert scale renders the data equivalent to interval data. For this study, we have used a seven-point Likert scale (1-7) which confirms the data as interval scale data.

Reliability Tests

Tables 1 shows the measurement and descriptive statistics of the variables. Cronbach alpha for HRIS ($\alpha=0.71$), HR Practices ($\alpha=0.72$), Employee engagement ($\alpha=0.77$) and Employee Performance ($\alpha=0.74$) were all above 0.6. The average variance extracted are 0.553 (HRIS), 0.479 (HR Practices), 0.512 (Employee Engagement) and 0.637 (Employee Performance) respectively.

Multicollinearity Tests

The simplest method of identifying collinearity is by examining the correlation matrix for the independent variables. The presence of high correlations (generally 0.90 and higher) is a clear indication of substantial collinearity. Multicollinearity is measured by the recursive process of regressing each variable as the dependent variable with other variables as independent variables. Tolerance is defined as the amount of variability of the selected independent variable not explained by the other independent variables. The tolerance thus computed was below the threshold of 0.10 for all variables. This cutoff value of tolerance corresponds to a multiple correlation coefficient of 0.95 Quaosar, (2018).

Factorability Tests

A high level of multicollinearity is not desirable, but some amount of multicollinearity is needed for factor analysis because the objective of the analysis is to ascertain interrelated sets of variables. The starting point of factor analysis is a diagnosis of the factorability of the intercorrelation matrix of variables. The correlations ranged between 0.30 – 0.80 and the partial correlations on the SPSS output were all less than 0.5 indicating the suitability of data for factor analysis. Bartlett's test of sphericity was rejected indicating the absence of a non-identity matrix and suitability for factor analysis. The results of the tests conducted to assess factorability are presented as follows:

1. Inter-item correlations. A visual examination of the correlation matrix does not show any anomalously high (>0.90) value of correlation. Mid ranges for the correlations confirm the factorability.
2. Anti-image correlation matrix diagnosis- The diagonal values of the anti-image correlation matrix are all greater than 0.5 while the off-diagonal values are very small. This confirms the presence of a very good factor structure.

3. Measures of Sampling Adequacy (MSA): Sampling adequacy is tested using Kaiser-Meyer-Olkin (KMO) index. The data returns a KMO index of 0.865, which is greater than the threshold for excellent adequacy.
4. Bartlett's test of sphericity: With a p-value of less than 0.05, Bartlett's test rejected the hypothesis that the factor matrix is an identity matrix. The test results confirmed the factorability of the correlation matrix.

RESULTS

Of the respondents in this research, 16.3% were in the age group of 30-40 year age group, 23.2% in the age group of 40-45, 32.2% in the age group of 45-50, 13.4% in the age group of 50-55 and 14.9% in > 55-year age group. 38% of the respondents were educated up to Graduation, 36% of the respondents were educated up to Postgraduate 24% had professional qualifications and 1% held doctorate degrees. 81.6% of respondents were male.

The results of the structural equation modelling are given in Figure 2.

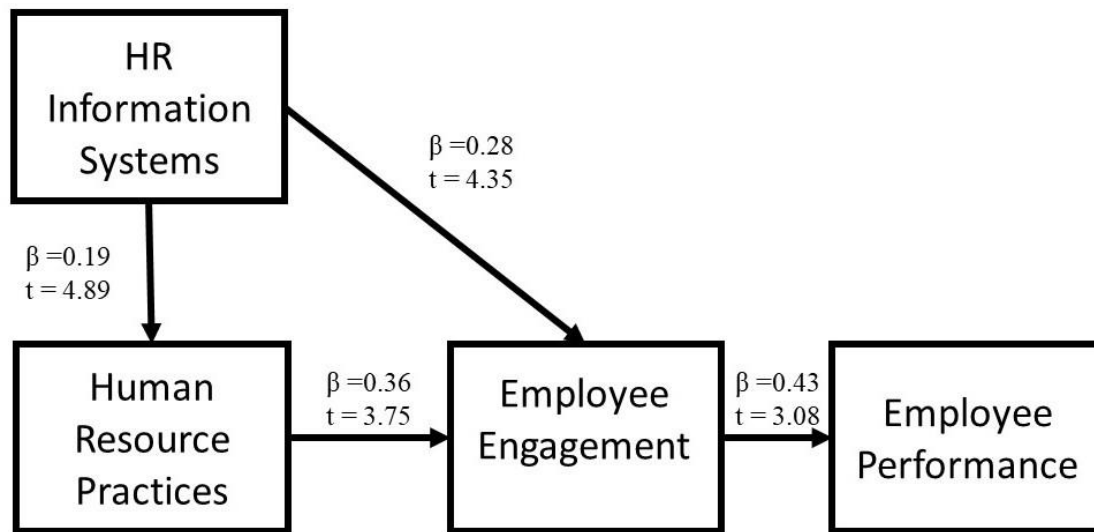


FIGURE 2
STRUCTURAL MODEL

Hypothesis	β Coefficient	t value	P value	Result
H1: HRIS significantly affects Human Resource practices	0.19	4.89	0.0000*	Accepted
H2: Human resource practices have a significant effect on employee engagement	0.36	3.75	0.0001*	Accepted
H3: HRIS has a significant effect on employee engagement.	0.28	4.35	0.0000*	Accepted
H4: Employee engagement has a significant effect on employee performance.	0.43	3.08	0.0010*	Accepted

All the hypotheses were accepted with t values exceeding 2.58 indicating significance at $\alpha=0.01$ level. The results of hypothesis testing are summarized. Various goodness of fit indices GFI (0.91), IFI (0.92), CFI (0.89) and TLI (0.91) indicate a satisfactory fit. $\chi^2/df=4.35$, Root mean

square error approximation (RMSEA) =0.0591 and Standardized Root Mean Square Residual (SRMR)=0.0434 are all within acceptable limits.

For effectively managing the performance of the employees and ensuring the participation of the employees, HRIS has emerged as one of the critical methods (Qadir & Agrawal, 2017; Silva & Lima, 2018). High costs associated with the transition from conventional HRM to its automated systems, insufficient employee training, inadequate infrastructure, insufficient technical knowledge, and inadequate financing, which is expected to be approved by the top management are widespread and a major obstacle to HRIS success (Al-Dmour et al., 2017; Jahan, 2014). HR professionals use a range of applications to keep the human resources department accountable for the development of the organisation (Thite et al., 2012; Al-Adawi et al., 2005; Beckers & Bsat, 2002). Jayabalan et al. (2020) reported that HRIS successfully decreases HR expenses. Our results show a significant relationship of HRIS success with both HR practices and employee engagement. Employee engagement was shown to have a significant relationship with employee performance. These results are in line with the existing literature (Sahin, 2014; Tajeddini et al., 2017; Teotia, 2012; Saxena & Srivastava, 2015).

Conclusion and Recommendations

Human Resource Information Systems are the new age phenomenon to replace the biased and erroneous conventional HRM practices that often result in the formation of a negative perspective by the employees in concern to monitoring their performance. The findings of the current study profoundly confirm that HRIS can enhance the work engagement and performance outcomes of the individual employees provided that its implementation is backed by the support of top management and responsiveness of the HRM to learn new technologies.

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