Measuring the Effectiveness of HRIS using Structural Equation Modelling: A study with reference to AKPL, Krishnapatnam, SPSR Nellore, AP

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Abstract: This research aims at establishing a relationship between the factors affecting the effectiveness of the Human Resource Information System. Seven variables were identified and used in the study. Confirmatory Factor Analysis was conducted, and a Human Resource Information System model was developed using Structural Equation Modelling. A close relationship between the factors affecting the HRIS and the effectiveness of the HRIS was established. The results of this study provide a decent model fit. This calls for user training as well as creating employee awareness resulting in an effective Human Resource Information System by reduction of cost.

Keywords: Structural equation model, observed variables, confirmatory Factor Analysis

INTRODUCTION

This paper presents an overview of the type hypotheses, statistical theory, and major issues relevant to specifying, estimating, evaluating, and interpreting structural equation models. Structural equation modelling (SEM) is a collection of statistical techniques that allow a set of relationships between one or more independent variables (IVs), and one or more dependent variables (DVs), to be examined. Therefore, the researcher has selected technology infrastructure, top management support, system integration, data security& privacy measures and system customization & flexibility as the independent variables. The effectiveness of HRIS influences the various dependent variable by mediating variables like user training & support, employee awareness. This analysis has taken with support of the selected organization Adani Krishnapatnam Port Limited, Krishnapatnam (AKPL), SPSR Nellore district, Andhra Pradesh.

REVIEW OF LITERATURE

Quaosar, G. M. and Rahman, M. S. (2021). "Human Resource Information Systems (HRIS) of Developing Countries in 21st Century: Review and Prospects." The main goal of this study is to determine the uses of human resource information systems (HRIS) in various firms and their results. The results of this study are important for identifying adoption hurdles for HRIS and raising awareness of them. The study also wants to highlight how forward-thinking businesses implement a thorough plan for managing their human resource information systems and provide decision makers with high-quality data.

Kalwala, S. and Sekhar, G. C. (2019). Study aimed to analyse the "Effectiveness of human resource information system: a review of literature". Study found that HRIS is a software solution for large, mid-sized and small business to help automate and manage the Human Resource activities. The success of the organization relies on execution. Value chain is the key factor which promotes service quality, innovation, responsiveness, and also defines positions for specific business competition on an on-going basis. However, HRIS is more simple aggregation mechanism for HRM, such issues were identified in the reviewed studies. This paper also witnessed an interesting issue that HRIS has a very wide scope in covering various HR activities, but it is the responsibility of the organization to take necessary steps in adopting the suitable technology. Further, it was also found from these studies that introduction of the technology in the organizations have high impact in every field of the organization.

Ali, M. and Shanfari, S. A. (2019). Study investigated the "ICT and HRM - management perspective about the changing scenario". This paper focuses on ICT

related changes particularly associated with the Human Resource Management. In the present day of complex and dynamic business environment, the application of information and communication technology has become inevitable in all the operations of business enterprises across the world. Human resource management is the key operation of an organisation as the efficiency of the whole organisation is highly influenced by the successful operation of human resource management. This paper has dealt with the application of ICT in the HRM of an organisation highlighting the challenges faced by and the opportunities available for organizations of the present-day business environment.

Fenech, R., et al, (2019). Study explored "the changing role of human resource management in an era of digital transformation". The purpose of this study is to explore the changing role of human resource management in an era of digital transformation. The main findings are that whilst digitalization impacts day-to-day HR practices and procedures particularly with the use of human resources information systems there is less emphasis on the role of HR in contributing to the strategy of digitalization.

Taskar, A. R., et al, (2018). "A study of development of human resource information systems (HRIS) and its effectiveness in the banking sector of India". Banks started adopting HRIS software for HR operations. HRIS helped bank for decision making for senior management and personnel administration. Proper training should be given to the employee to understand and implement HRIS. It is also observed that in public sector banks candidates are selected through IBPS. (Institute of Banking Personnel Selection) and data is stored in HRIS. In private sector banks majority of banks adopted HRIS.

Wibawa, J. C., Izza, M. and Sulaeman, A. (2018). The current study examined the "HRIS (human resources information system) design for small, micro, and medium enterprises". The purpose of this study was to create a system that handles human resource management for all MSMEs. Study revealed that through the development of HRIS (Human Resources Information System) for MSME, it is expected to have

access to a better human resource management and relevant with the development era.

Qadir, A. and Agarwal, S. (2017). Study explored "human resource information system (HRIS): re-engineering the traditional human resource management for leveraging strategic human resource management". This paper presents a conceptual framework through a HRIS model underpinning the potentials and opportunities that HRIS offers for practicing SHRM in the twenty first century for the academia and industry professionals.

The literatures invariably show that the way human resources were managed three decades ago have seen sea level changes. Expected benefits of introducing machines and software for managing HR, have for sure eased-up HR professionals work stations. This study is basically a framework for HRIS users who should ensure that their operational, transactional needs are sufficiently met through HRIS.

METHODOLOGY OF THE STUDY

Data sources: This research depends on the major sources of data, that is primary data and secondary. The primary data sources are mainly collecting from the selected respondents on the research problem selected. The secondary data sources are mainly gathered from the existing sources like office manuals, previous studies, and annual reports of the organization. In this case, the researcher has adopted the both sources of data and collected through proper methods.

Data Collection: The researcher has collected the primary data through the structured questionnaire. The questionnaire containing the different components and factors that related to the function and applications of the HRIS of the selected organization. It has adopted Likert 5 Point scale method of questionnaire.

Sampling Methods& Design: Adani Krishnapatnam Port Limited has operates the sea port operations with about 9000 more employees including daily wagers. Managing of the regular on roll employees to the daily wage employees are effectively managing by the HR department with HRIS applications. Therefore, the researcher has got an opportunity to take good number of the respondents to study the existing HRIS system.

Sampling Size

S.No	Category of Respondents	Total Population	Sample Size	Sampling Method
1	Top Level Management	20	12	

2	Middle level Management and staff	1100	158	Random Sampling
3	Operational level Management and Staff	3000	365	
Total		4120	525	13% on Total Population

The sampling method is adopted by the researcher is based on the requirements of the research and the sources of the data availability.

Data Analysis Tools: The researcher has adopted the appropriate data analysis tools to understand the HRIS practices in the organization and also to develop the HRIS models. In particular structural equation model is applying with an SPSS software tools in the data analysis and interpretation.

OBJECTIVES OF THE STUDY

This research has initiated to study the following objectives.

1. To design a structural equation model of HRIS using independent variables with direct effect.
2. To design a structural equation model of HRIS on user training and support as mediating factor for the organization selected.
3. To develop a structural equation model of HRIS on employee awareness as mediating factor for the organization selected.

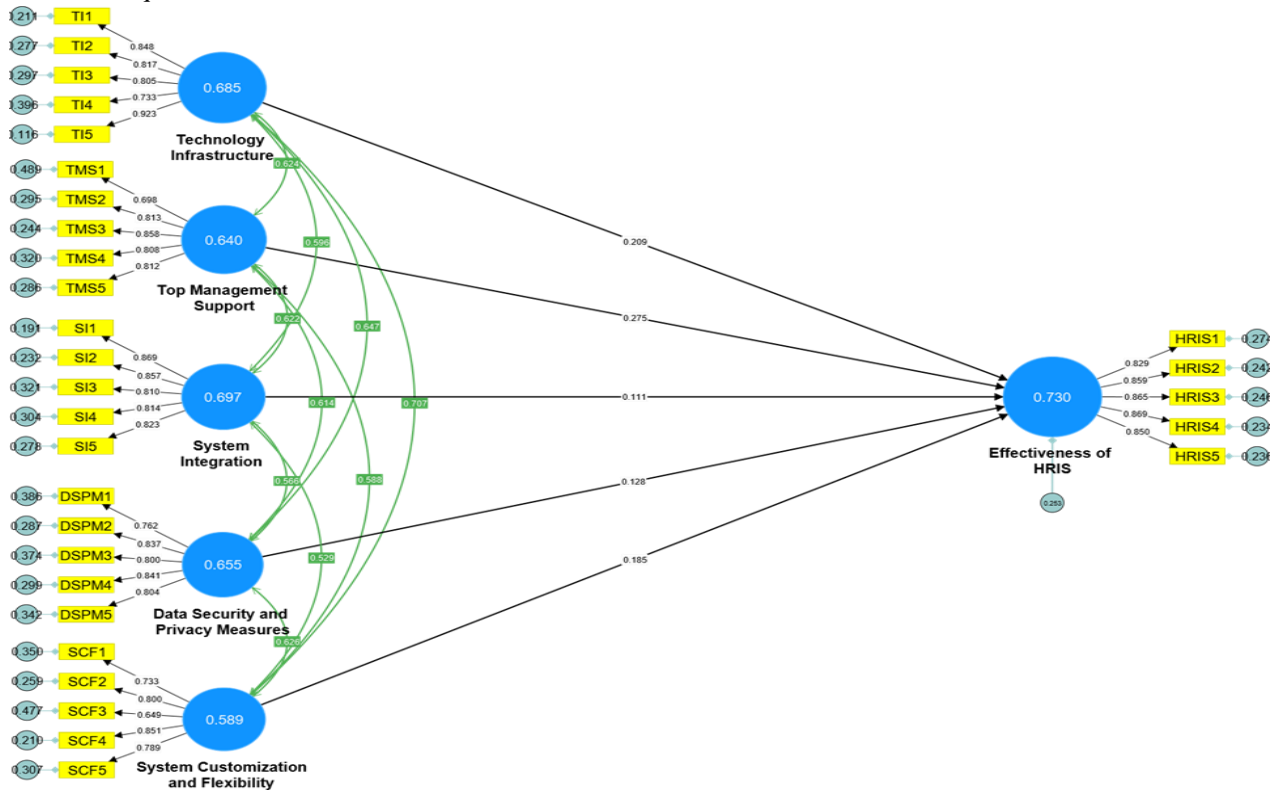Structural Equation Model with Direct Effect:

Figure.1.1: Structural Equation Model of HRIS with Direct effect

There are three different categories of variables in the model. They are namely independent factors and Antecedents of Human Resource Information System and the Mediating variables are employee awareness and Training and Support. From the above model shown in Fig.1.1 one can see the direct relationship between the antecedents of Human Resource Information System and the dependent factor the effectiveness of Human Resource Information System.

The ChiSqr/df ratio of 3.648 is below the standard value of 5, witnessed that relatively good fit. The MSEA value of 0.071 which is less than the actual value 0.080 and it is in the acceptable range. The Goodness-of-Fit Index (GFI) of 0.837 and Adjusted GFI (AGFI) of 0.806 explain a moderate fit. PGFI of 0.702 indicates the model is bit complex. The Standardized Root Mean Square Residual (SRMR) value of 0.039 suggests a good fit. The Normed Fit

Index (NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) values of 0.890, 0.908, and 0.917, respectively, indicate acceptable fit. The AIC and BIC values are 1572.615 and 1892.370 exhibits the goodness of fit compared to other models in the contemporary context. The provided R-squared value of 0.779 for Effectiveness of HRIS indicates that approximately 77.9% of the variance in HRIS effectiveness is explained by the observed variables included in the model. The Cronbach's alpha value of 0.904 of Data Security and Privacy Measures suggests high internal consistency and reliability. Effectiveness of HRIS, the Cronbach's alpha value of 0.931 indicates high internal consistency, reliability, suggesting strong correlation among the observed indicators measuring HRIS effectiveness. The Cronbach's alpha for System Customization and Flexibility is 0.875 reflects high reliability. The Cronbach's alpha value of System Integration is 0.920 which is high internal reliability of the model. For Technology Infrastructure, the Cronbach's alpha value of 0.913 suggests high internal reliability implying strong correlation among the observed indicators measuring technology

infrastructure. The Cronbach's alpha value of Top Management Support is 0.898 which explains high internal reliability. Therefore, it is witnessed form the research that, in all aspects the direct effect shows the significant internal relationship among the variables in the data.

Structural Equation Model with User Training and Support:
From the Fig.1.2 witnessed that there are some set of independent factors and the dependent factor is Human Resource Information System (HRIS) and the employee training and support will be the mediating factor in the developed model. The ChiSqr/df ratio of 3.691 is below the commonly threshold value of 5, shows the relatively good fit of the model in the present context. The (RMSEA) value of 0.072 indicating a reasonably good fit. The Goodness-of-Fit Index (GFI) of 0.800 and Adjusted GFI (AGFI) of 0.766 show the moderate fit of the model. The PGFI of 0.685 indicates the model is bit complex with different
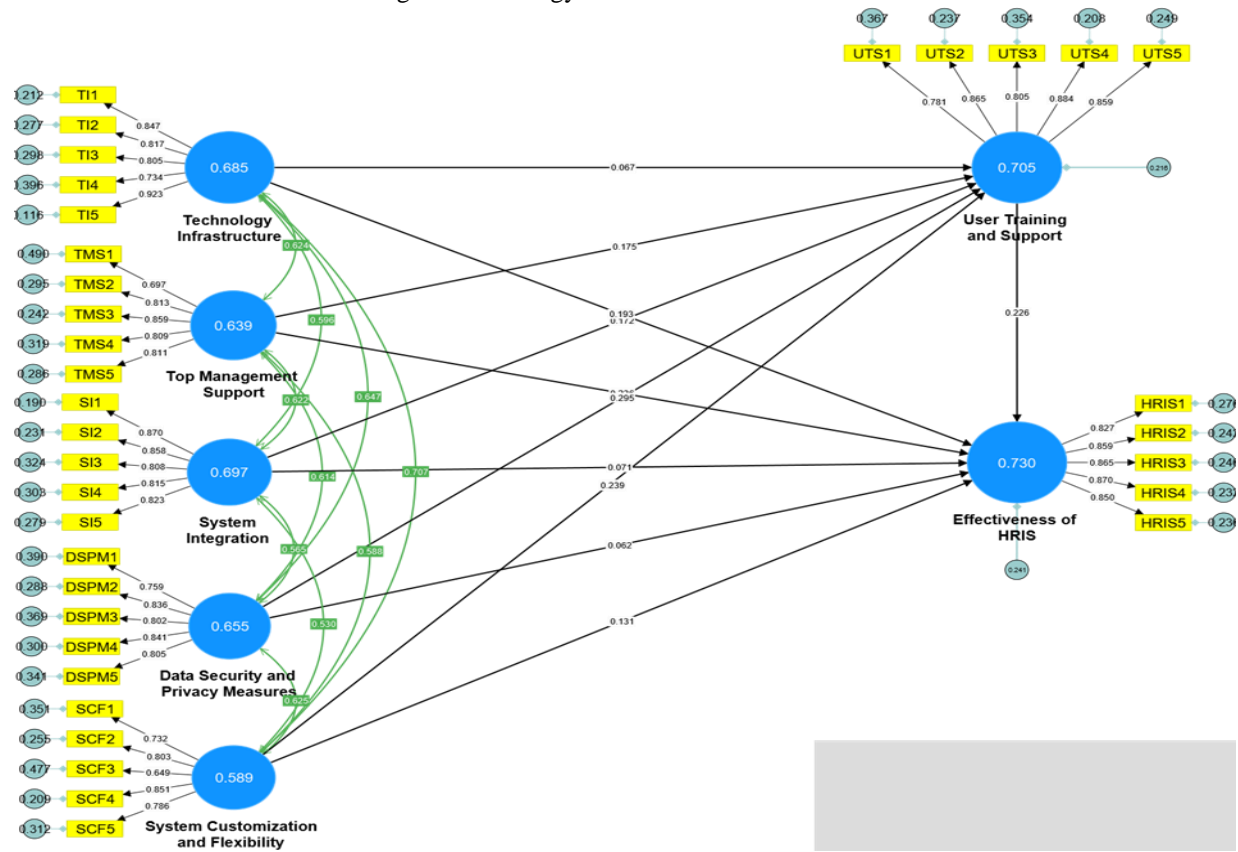

Fig.1.2: Structural Equation Model of HRIS with Factor Loadings, Path Co-efficient, AVE and In-Direct effect (User Training and Support.

constructs. (SRMR) value of 0.039 suggests a good fit. The Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) values of 0.875, 0.895, and 0.905, respectively, indicate acceptable fit. The R-squared value of 0.798 for Effectiveness of HRIS indicates that approximately 79.8% of the variance in HRIS effectiveness is explained by the other variables which are shown in the model. An R-squared value of 0.725 for User Training and Support suggests that around 72.5% of the variance in user training and support and the rest of the variance explained by the other factors. The Cronbach's Alpha value of Data Security and Privacy Measures, is 0.904 suggests high internal reliability, indicating strong correlation. The Effectiveness of HRIS, the Cronbach's alpha value of 0.931 indicates Structural Equation Model with Employee Awareness:

strong internal consistency, suggesting strong correlation among the observed indicators measuring HRIS effectiveness. The Cronbach's Alpha of System Customization and Flexibility is 0.875 reflects high internal consistency reliability, indicating strong correlation. For System Integration, the Cronbach's alpha is 0.920 exhibits the strong internal correlation among the variables. For Technology Infrastructure, the Cronbach's alpha value of 0.913 suggests high internal consistency reliability. For Top Management Support, the Cronbach's alpha value of 0.898 also indicates high internal consistency and reliability. For User Training and Support, the Cronbach's alpha value of 0.922 reflects high internal consistency reliability, indicating strong correlation among the observed indicators measuring user training and support.
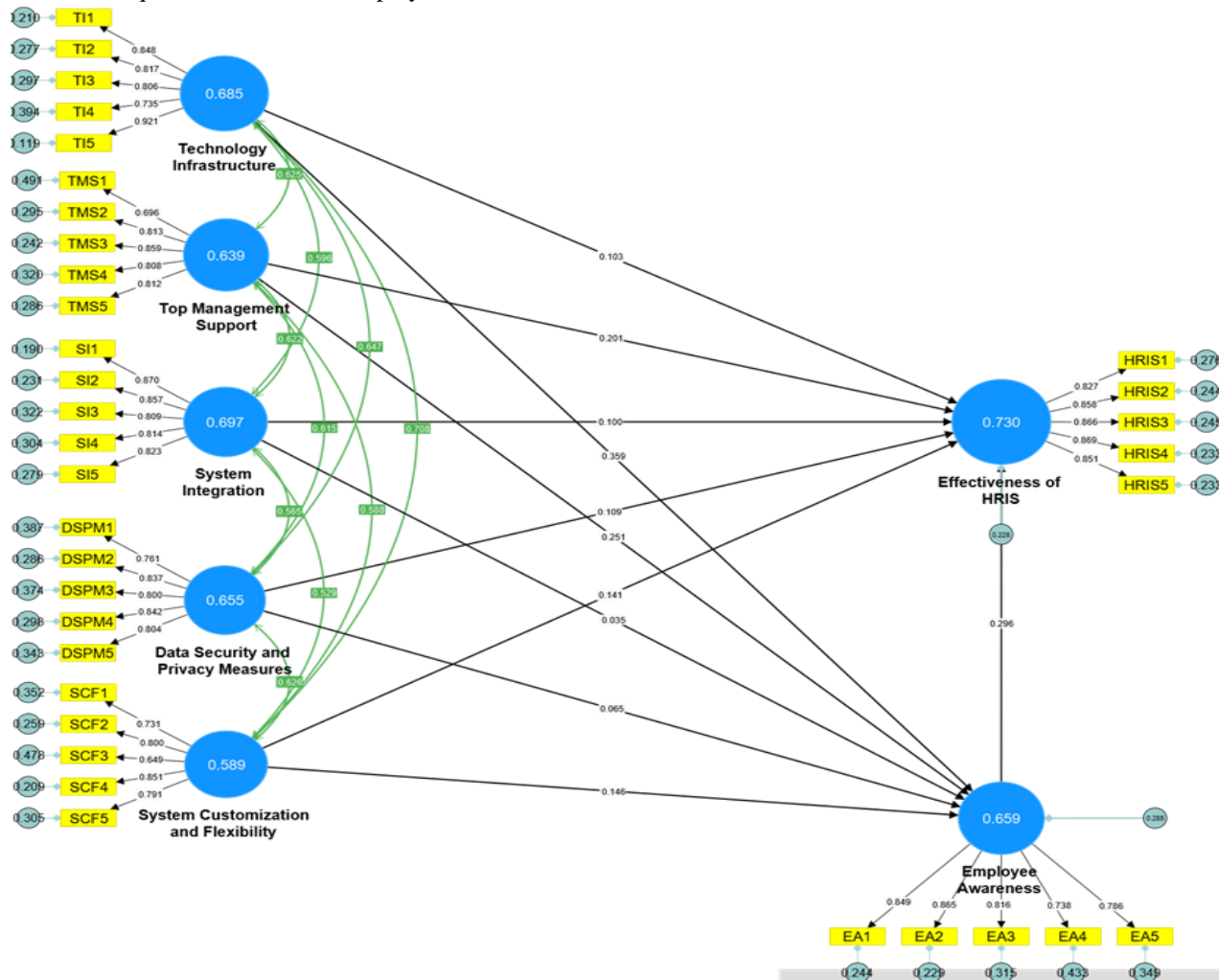

Figure.1.3: Structural Equation Model of HRIS with Factor Loadings, Path Co-efficient, AVE and In-Direct effect (Employee Awareness)

From the Fig.1.3 one can understand the mediating role of employee awareness in between the facilitating factors of HRIS and the effectiveness of Human Resource Information System. The ChiSqr/df ratio of 4.607 is below the standard value of 5, suggesting a relatively good fit. The Root Mean Square Error of Approximation (RMSEA) value of 0.073 is slightly below the recommended threshold of 0.08, indicating a moderate fit. The GFI is 0.868 and Adjusted GFI (AGFI) is 0.829 suggest a reasonably good fit. The SRMR value of 0.042 suggests a good fit. Additionally, the Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) values of 0.845, 0.861, and 0.874, respectively, indicate acceptable fit. The R-Squared value of 0.719 which is 71.9% of the variance in effectiveness is explained by the observed variables. An R-squared value of 74.6% for Employee Awareness is accounted for the included observed indicators. The Cronbach's alpha value 90.4% of Data Security and Privacy Measures explained. The Cronbach's alpha value of System Customization and Flexibility, the alpha value of 0.875 high reliability, indicating strong correlation among the variables in the data. Therefore, the Cronbach's alpha value for System Integration is 92% and Technological Infrastructure is 91.3% and for remaining all other factors the Cronbach's alpha reliability value shows there is a strong internal consistency of the data.

FINDING

1. From the figure 1.1, the ChiSqr/df ratio of 3.648 is below the standard value of 5, witnessed that relatively good fit. The RMSEA value of 0.071 which is less than the actual value 0.080 and it is in the acceptable range. The Goodness-of-Fit Index (GFI) of 0.837 and Adjusted GFI (AGFI) of 0.806 explain a moderate fit. PGFI of 0.702 indicates the model is bit complex. The Standardized Root Mean Square Residual (SRMR) value of 0.039 suggests a good fit. The Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) values of 0.890, 0.908, and 0.917, respectively, indicate acceptable fit.

2. It is observed from the figure 1.2 that the ChiSqr/df ratio of 3.691 is below the commonly threshold value of 5, shows the relatively good fit of the model in the present context. The (RMSEA) value of 0.072 indicating a reasonably good fit. The Goodness-of-Fit Index (GFI) of 0.800 and Adjusted GFI (AGFI) of 0.766 show the moderate fit of the model. The PGFI of 0.685 indicates the model is bit complex with different constructs. (SRMR) value of 0.039 suggests a good fit. The Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) values of 0.875, 0.895, and 0.905, respectively, indicate acceptable fit.

3. From the figure 1.3, the ChiSqr/df ratio of 4.607 is below the standard value of 5, suggesting a relatively good fit. The Root Mean Square Error of Approximation (RMSEA) value of 0.073 is slightly below the recommended threshold of 0.08, indicating a moderate fit. The GFI is 0.868 and Adjusted GFI (AGFI) is 0.829 suggest a reasonably good fit. The SRMR value of 0.042 suggests a good fit. Additionally, the Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) values of 0.845, 0.861, and 0.874, respectively, indicate acceptable fit.

CONCLUSION

Structural Equation Modelling is usually used because it permits the measurement of several variables and their interrelationships simultaneously. It is more versatile than other multivariate techniques because it allows for simultaneous, multiple dependent relationships between variables. Therefore, the results indicate that Effectiveness of HRIS is directly and indirectly influenced by independent variables of Technology Infrastructure, Top Management Support, System Integration, Data Security& Privacy Measures and System Customization& Flexibility and mediating variables of User Training& Support, Employee Awareness.

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