

Exploring the Relationship Between Human Resource Management Practices and Innovation in South African Telecommunication Industry

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Abstract

The South African telecommunications industry has experienced rapid growth driven by technological advancements and an increasing demand for innovative services. As competition intensifies, effective Human Resource Management (HRM) practices are vital for fostering innovation. However, many telecommunications firms struggle to align their HRM strategies with innovation goals, leading to diminished employee performance and missed market opportunities. Despite the significant literature on HRM and innovation, little research focuses on the South African telecommunications sector, particularly technology startups. This study aims to address this gap by examining how tailored HRM practices can enhance innovation within South African telecommunications firms, using Vodacom, Rain, and Cell C as case studies. A closed-ended questionnaire was distributed to 30 senior management personnel, with data analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings demonstrate a positive relationship between recruitment, training, communication, and compensation strategies and innovation. These results provide practical insights for firms seeking to optimize HRM practices to drive long-term innovation and competitiveness in the evolving telecommunications landscape.

Keywords: Human Resource Management (HRM), Innovation, Recruitment and Selection, Training and Development, Communication Practices.

INTRODUCTION

In industrialized economies such as the United States, Japan, and the United Kingdom, business innovation takes several forms, including product innovation, process innovation, and organizational innovation (Anand, McDermott, Mudambi, and Narula, 2021). For example, in the United States, product innovation is seen in the technology sector, where companies such as Apple constantly release new and improved goods to the market (Arora et al, 2020). Jemala's (2021) study found that the US leads the world in innovation, with technology driving GDP growth. Japan is also recognised for process innovation, especially in the car sector. Toyota has implemented lean production to improve productivity and save costs. Japan remains one of the world's most imaginative nations, according to Stier (2022), with a focus on industrial process development. UK companies like Unilever use innovative management approaches to foster creativity and cooperation. According to Paswan, Guzmán, and Pei (2021), the UK has invested much in R&D, notably in medicines and aircraft, advancing organisational innovation.

Entrepreneurship and economic growth in Sub-Saharan Africa depend on organisational innovation. Nigerian company Flutterwave has developed frictionless payment technologies that promote financial inclusion across the continent (Ahmed et al., 2023). Tech and new business models have helped Flutterwave alter Africa's fintech sector, giving small businesses and people access to digital financial services. According to Sarpong and Nketiah-Amponsah (2022), fintech solutions can revolutionise Sub-Saharan Africa's financial access and inclusive growth through organisational innovation. Mobile money transactions have expanded due to innovations like M-Pesa, which has become a worldwide model. The UN Economic Commission for Africa (UNECA) (2019) found that process innovation drives industrialisation and sustainable development in the region, emphasising the need for ongoing innovation capacity building and technology transfer. Entrepreneurship and economic growth in Sub-Saharan Africa depend on

organisational innovation. Nigerian company Flutterwave has developed frictionless payment technologies that promote financial inclusion across the continent (Ahmed et al., 2023). Flutterwave's technology and new business models have transformed Africa's fintech sector, enabling small businesses and people digital financial services. (Emmanuel Atagboro, 2022).

A range of HRM approaches may be used to efficiently manage an organization's staff to fulfil its goals (Pattanayak, 2020). Recruitment involves finding, attracting, and selecting competent candidates for company employment. Training and development programs enhance employees' abilities, knowledge, and competencies for efficient job performance (Barrena-Martínez et al., 2019). Performance evaluation systems evaluate employees' performance against goals and provide feedback to encourage improvement and goal alignment (Castro et al., 2020). Recruiting strategies may effect product innovation by attracting and selecting employees with diverse talents, experiences, and perspectives that foster creativity and ideation. Training and development programmes may also encourage process innovation by giving personnel the technical and problem-solving skills to optimise and improve processes (Wilton, 2022). Performance appraisals may also encourage experimentation and continuous improvement by providing feedback and recognition for creative ideas (Wilton, 2022).

Due to technological advances and increased demand for new services, the South African telecommunications sector has grown rapidly (Thakoor, 2020). Effective HRM practices become more critical for generating innovation as telecommunications companies compete (Thakoor, 2020). Many technological organisations in this sector struggle to implement HRM practices that support their creative goals. This imbalance usually lowers employee performance, innovation, and market opportunity (Dlamini et al., 2020). Therefore, knowing how HRM practices affect innovation results is crucial for these organisations to survive in a competitive context.

RESEARCH METHODS

Population and sample size

This research will include Cape Town-based technology companies in the South African telecoms market. Vodacom (Cape Town branch), Rain, and Cell C; all known for their innovative telecom sector achievements; will be picked. The sample will include 30 senior management personnel, such as CEOs, CHROs, and Innovation Managers, who make decisions about human resource management practices and innovation strategies in their organisations to gain comprehensive insights. This selection will illuminate HRM practices and innovation in Cape Town telecommunications.

Data collection instrument

A closed-ended form was made and sent to customers in Saudi Arabia. The questionnaire is split into two parts. The first part asks about the respondents' age, gender, highest level of schooling, place in the organisation, and experience. The second part asks specific questions about the factors being studied. Questions were asked on a five-point Likert scale ranging from strongly agree to strongly disagree, with 1 indicating strong disagreement and 5 indicating strong agreement. The core data was collected using an online survey.

Reliability and validity

Hierarchical concept reliability and validity were assessed using a confirmatory factor analysis (CFA). Yusoff et al. (2020) examined indicator, composite, convergent, and discriminant validity of the measurement model. Factor loadings examined indication dependability. The indicator factor loadings should be 0.7 or higher such that the construct and its indicators share more variance than the error term (Cheung et al., 2024). The components' internal consistency was assessed using Cronbach's alpha (CA) and composite reliability (CR). Every variable should have Cronbach's Alpha > 0.70. Next, the reflective constructs' convergent

validity was examined using AVE. Rasoolimanesh (2022) suggests AVE values > 0.5 for convergent validity. AVE measures how well an idea explains indicator variance vs measurement error (Yusoff et al., 2020).

Data analysis

SPSS 26 data was transferred to Smart-PLS for analysis. The current study examined independent-dependent variable connections using empirical analysis. The main data analysis approach in this study was partial least squares structural equation modelling. PLS-SEM is appropriate for small sample studies (Kamis et al., 2020). The final sample (30) was small. This supports using PLS-SEM in this study. Furthermore, Hair Howard and Nitzl (2020) argue that SEM is the best estimation technique for investigating the correlations between many variables. We used the PLS-SEM algorithm to get path coefficients that showed the strength of the correlations between variables (Kamis et al, 2020).

RESULT AND DISCUSSION

The results of this study as a consequence of determining the relationship between HRM practices and innovation contribute to the literature as follows. When testing recruitment and selection, training and development, communication, and reward and compensation hypotheses, it was established that each of these practices had a positive and significant effect on innovation as evidence by prior studies. The positive and significant relationship between recruitment and selection and innovation ($r = 0.489$; $p = 0.009$) is consistent with RBV theory that states that organisations can obtain competitive advantage by recruiting and selecting employee with requisite skills, knowledge, talents and innovative propensities (Barney, 1991). Mathekga, Mahlaela and Maciko (2022) also discovered that organizations that placed importance on recruitment and selection of employees are more likely to encourage innovative behaviors among their employees. Another survey conducted by Lee et al (2020) also shows that the importance of choosing people with high adaptability of the personnel is extremely high in innovations. In the South African context this result suggests that, where rapidly changing competitive dynamics characterize the industry, as is the case in telecommunications, firms needs to place greater emphasis on the identification of people whose problem solving capabilities will enable the creation of new solutions and the adaptation of existing ones.

Demographic information

The study targeted 30 respondents and all of the responded making it a response rate of 100%. Table 1 presents the demographic information of the respondents.

Table 1: Demographic information

Demographic	Category	Frequency	Percentages
Gender	Male	19	63.3%
	Female	11	36.7%
Age	Less than 25 years	2	6.7%
	26-30 years	9	30%
	31-40 years	12	40%
	Above 40 years	5	16.7%
Highest level of education	Diploma	2	6.7%
	Bachelors degree	10	33.3%
	Masters degree	11	36.7%
	PhD	8	26.7%
Position in the organization	Senior management	4	13.3%
	CEO	6	20%
	Chief Human Resource Officers	12	40%
	Innovation managers	8	26.7%
Experience	Less than 1 year	2	6.7%

	1-5 years	4	13.3%
	6-10 years	15	50%
	Above 10 years	7	23.3%

The demographic analysis of the study reveals a predominantly male-dominated sample, with 63.3% of respondents being male and 36.7% female. This indicates a gender imbalance, which is reflective of the broader trends in leadership roles within the telecommunications industry. The age distribution shows that the majority of participants fall within the 31-40 years age group, accounting for 40%, followed by 26-30 years (30%) and those above 40 years (16.7%). Only 6.7% of respondents are younger than 25 years, suggesting that more experienced individuals hold key decision-making roles related to human resource management and innovation within these companies.

In terms of education, a significant portion of the sample holds advanced degrees, with 36.7% having a master's degree and 26.7% holding a PhD, demonstrating the highly educated nature of the workforce. Bachelor's degree holders make up 33.3%, while only 6.7% have a diploma. Regarding their roles within the organization, Chief Human Resource Officers (CHROs) represent the largest group at 40%, followed by innovation managers (26.7%), CEOs (20%), and senior management (13.3%). When looking at experience, half of the respondents (50%) have between 6-10 years of experience, and 23.3% have over 10 years, indicating a seasoned group of professionals involved in the study. This experience distribution supports the idea that more experienced professionals are driving innovation and human resource practices within these telecommunications firms.

Construct validity, correlation and reliability analysis results

Several validity and reliability tests were performed in order to assess the validity and reliability of the study's research tools and data. Factor Loading indicates how well an item represents its underlying concept. Normally, factor loading above .708 is advised (Hair et al, 2019). In addition to factor loading, the measurement model must contain reliability (Cronbach's Alpha and Composite Reliability). Factor analysis is a technique for evaluating which alternative reasons are the most significant by representing the observed data values as functions of these causes. The statements that were exposed to factor analysis were rated using a 5-point Likert scale. The statements in the questionnaire were questions representing the four variables. To measure the variables, the study used a questionnaire with 30 items generated on a 5-point Likert scale. Table 2 displays the factor analysis results:

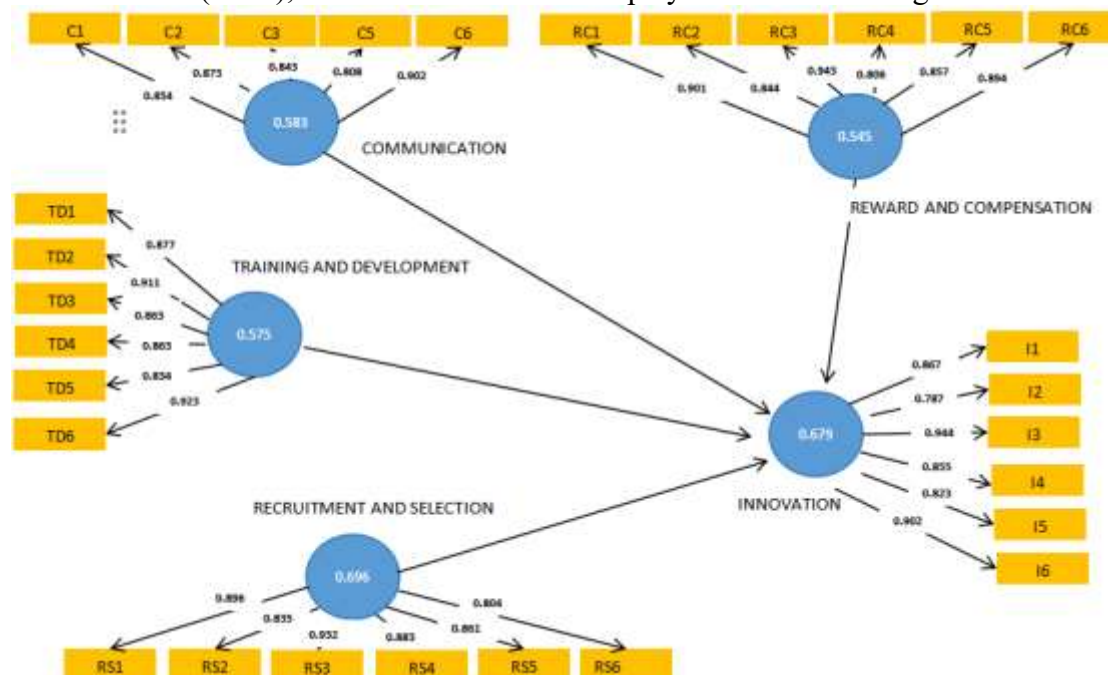
Table 1: Factor Analysis Results

Variables	Factors	Factor loads	Factor loads Tist.	Factor weights	Factor weights Tist.	Variance width factor
Innovation	I1	0.752	20.453	0.347	11.435	1.223
	I2	0.757	17.445	0.334	17.334	1.093
	I3	0.771	34.223	0.442	13.554	1.778
	I4	0.713	18.775	0.237	12.689	2.009
	I5	0.772	15.886	0.321	15.339	2.112
	I6	0.883	19.009	0.337	13.087	2.009
Recruitment and selection	RS1	0.747	17.884	0.457	12.556	1.875
	RS2	0.891	27.778	0.290	14.330	1.554
	RS3	0.734	34.886	0.238	16.443	1.665
	RS4	0.783	12.344	0.300	9.445	2.005
	RS5	0.861	34.885	0.428	10.994	2.665

	RS6	0.751	19.88	0.283	9.886	2.221
Training and development	TD1	0.722	44.761	0.365	11.848	2.583
	TD2	0.785	22.343	0.334	15.665	2.112
	TD3	0.758	45.633	0.551	16.088	1.088
	TD4	0.854	23.554	0.332	13.543	2.309
	TD5	0.987	47.331	0.415	16.445	2.109
	TD6	0.783	31.556	0.423	12.445	1.445
Communication	C1	0.858	45.861	0.336	11.333	2.545
	C2	0.837	19.001	0.442	9.764	1.998
	C3	0.766	23.545	0.234	10.002	1.763
	C4	0.897	29.223	0.402	12.565	1.329
	C5	0.788	27.887	0.223	15.776	1.994
	C6	0.774	21.432	0.223	16.343	1.008
Reward and compensation	RC1	0.804	56.882	0.406	11.223	1.990
	RC2	0.884	19.554	0.433	17.445	2.449
	RC3	0.774	18.996	0.344	16.309	1.990
	RC4	0.763	29.005	0.435	17.765	1.336
	RC5	0.861	45.883	0.388	15.009	1.885
	RC6	0.982	19.665	0.288	10.768	1.224

In essence, factor loading is the relationship between a factor and a variable. Factor loading shows the variance on a certain factor that is explained by the variable. According to the SEM approach, a factor loading of 0.7 or higher shows that the factor extracts sufficient variance from the variable (Hair, Howard, and Nitzl, 2020). If the variance is less than 0.7, it should not be considered. As a result, all statements indicated proper factor loading, with scores greater than 0.7. The image below depicts the outer model, which includes all variables that were not excluded during component analysis.

Figure .1 shows the study's outer model. The construct displays the extracted average variance (AVE), while the outer model displays the factor loadings.



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Table 2: Construct Validity and Reliability Value of Scales

Latent Construct	Indicator	Indicator loading	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Innovation	I1	0.827	0.892	0.883	0.902	0.679
	I2	0.862				
	I3	0.879				
	I4	0.843				
	I5	0.828				
	I6	0.912				
Recruitment and selection	RS1	0.832	0.891	0.897	0.919	0.696
	RS2	0.857				
	RS3	0.881				
	RS4	0.838				
	RS5	0.815				
	RS6	0.782				
Training and development	TD1	0.747	0.944	0.957	0.95	0.575
	TD2	0.791				
	TD3	0.714				
	TD4	0.733				
	TD5	0.751				
	TD6	0.751				
Communication	C1	0.803	0.761	0.765	0.848	0.583
	C2	0.794				
	C3	0.698				
	C4	0.754				
	C5	0.823				
	C6	0.892				
Reward and compensation	RC1	0.758	0.861	0.866	0.893	0.545
	RC2	0.807				
	RC3	0.715				
	RC4	0.707				
	RC5	0.77				
	RC6	0.711				

The findings from the Construct Validity and Reliability Value of Scales table indicate that the measurement scales used for the latent constructs of Innovation, Recruitment and Selection, Training and Development, Communication, and Reward and Compensation show strong reliability and validity. For the Innovation construct, the indicator loadings range from 0.827 to 0.912, demonstrating that each item strongly correlates with the underlying innovation concept. The high Cronbach's alpha value of 0.892 indicates excellent internal consistency, meaning that the items measure the same underlying construct effectively. Rho_a (0.883) and rho_c (0.902) above the 0.7 criterion, demonstrating that the construct is assessed accurately across indicators. The average variance extracted (AVE) is 0.679, suggesting that indicators

explain a large percentage of the construct's variation, demonstrating excellent convergent validity.

The Recruitment and Selection construct has significant indicator loadings from 0.782 to 0.881, indicating a strong relationship between individual components and the construct. Cronbach's alpha is 0.891, indicating strong internal consistency. The construct's dependability is further supported by composite reliability ratings above the suggested level ($\rho_a = 0.897$, $\rho_c = 0.919$). Recruitment and selection has an AVE of 0.696, greater than the standard of 0.5, indicating that the concept explains enough variance. This shows that recruiting and selection procedures are measured well, helping us understand how they affect innovation.

Table 3: Heterotrait- Monotrait Ratio (HTMT) values

	Innovation	Recruitment and selection	Training and development	Communication	Reward and compensation
Innovation	0.311				
Recruitment and selection	0.326	0.302			
Training and development	0.291	0.222	0.311		
Communication	0.488	0.221	0.387	0.397	
Reward and compensation	0.349	0.322	0.233	0.307	0.232

To show discriminant validity, the HTMT ratio for structures that are conceptually different must be less than 0.85 and for structures that are conceptually the same it must be less than 0.9 (Hair, Howard, & Nitzl, 2020). All of the HTMT ratios are less than 0.85, which means that all of the latent components were found to be discriminant valid.

Hypothesis testing using structural equation model

To test the hypotheses, a 5000-bootstrap test was performed using the SmartPLS4 bootstrap technique to calculate the 95% confidence interval and p-values for the path coefficients. The bootstrap results are displayed in the following tables:

Table 4: Assessment of Direct Effects

Hypotheses	Relationships	Coefficients	Std Err	T Stat	P-values	F2	L95 % Bca CI	U95% Bca CI	Decision
H ₁	Recruitment and selection -> Innovation	0.489	0.073	2.596	0.009	0.035	-0.314	0.026	Supported
H ₂	Training and development -> Innovation	0.336	0.074	4.513	0.000	0.083	-0.479	0.189	Supported
H ₃	communication -> Innovation	0.555	0.051	3.047	0.002	0.024	0.039	0.242	Supported
H ₄	Reward and compensation -> Innovation	0.373	0.082	2.456	0.008	0.001	-0.134	0.192	Supported

The research analyses how organisational characteristics affect innovation in South Africa's telecommunications industry. Recruitment and selection boost innovation, as shown by a coefficient of 0.489, p-value of 0.009, and T-statistic of 2.596. Though tiny ($F^2 = 0.035$), the link is statistically significant and constant within the confidence range. Training and development also boost invention with a coefficient of 0.336, a 0.000 p-value, and a T-statistic of 4.513. The modest effect size ($F^2 = 0.083$) indicates its significant influence.

Effective communication is another important component with a coefficient of 0.555, p-value of 0.002, and T-statistic of 3.047. Although the effect size ($F^2 = 0.024$) is minor, it highlights communication's significant impact on creativity. A coefficient of 0.373, p-value of 0.008, and T-statistic of 2.456 show that reward and compensation methods enhance creativity. However, the effect magnitude is small ($F^2 = 0.001$), showing a little yet substantial impact. The findings show that recruiting, training, communication, and rewards boost creativity to varied degrees.

CONCLUSION

In conclusion, this study has found that the role played by human resource management recruitment and selection, training and development communication and reward and compensation to promote innovation in the telecommunication industry in South Africa cannot be over-emphasized. The results establish that comprehensively framed HRM practices enhance the development of the innovative organizational culture by recruiting the talented workforce, facilitating the organizational learning process and supporting knowledge sharing initiatives as well as rewarding innovativeness. These HRM practices offer a strategic HRM framework for developing the innovation capacity of the dynamic telecommunication organisations under conditions of rising competition and advanced technologies to support sustainable growth and competitiveness. In this research, the authors highlight the need to integrate HR management strategies to innovation goals for performance and firm gains.

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