



# A Study on Reliability Analysis for Sustainable HRM Using AI Tools

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## Abstract

Human Resource Management is imperative in this era. Proper management of HR, workplace policies with necessary measures and implementation could provide solutions to issues arising between team members and thereby minimizing the risk. When we are working with the multi item measures, we often estimate internal consistency reliability. In other words, internal consistency reliability tells us how consistent scores on different items are to one another. Through this paper using AI tools, we tried to infer that these consistency scores may lead to sustainable human resources management.

**Keywords :** Human Resource Management, AI Tools, Reliability, Multiitems

## 1. Introduction

Human resource management (HRM) has a long history of use. According to Jianhao, HRM was first invented in the 1960s and can be applied to anyone with a role in the company. Human resources (HR) also manages departments within the organization if they are directly or indirectly involved with employees [1].

### 1.1 Human Resource Management

Edwin B. Flippo defined HRM as “planning, organizing, directing, controlling of procurement, development, compensation, integration, maintenance and separation of human resources to the end that individual, organizational and social objectives are achieved.”

The National Institute of Personnel Management (NIPM) of India defined human resources – personal management as “that part of management which is concerned with people at work and with their relationship within an enterprise. Its aim is to bring together and develop into an effective organization of the men and women who make up enterprises and have regard for the well – being of the individuals and of working groups, to enable them to make their best contribution to its success”.

### 1.2 Sustainable Human Resource Management

Beginning in the 1980s, theory and research on HRM has started developing rapidly [2–5]

The common agreement in human resource management (HRM) literature suggests that organizations willing to attract and retain human resources for running business in the future must change the prevailing situation where human resources are rather consumed than developed. In doing this, sustainable HRM has been introduced recently as a response to changes on societal level, labor market, and employment relations. Sustainable HRM is seen as an extension of strategic HRM and presents a new approach to people management with the focus on long-term human resource development, regeneration, and renewal. However, the attributes of sustainable HRM, as compared to mainstream HRM, are not clear[6].

### 1.3 Reliability

In response to economic, environmental, and technological changes in recent decades, research in sustainable development theories has shifted toward adapting to human resource management and creating sustainable human resource management; However, there is no standard tool for measuring the indicators of sustainable human resource management [7].

### 1.4 Reliability Analysis

Cronbach's alpha is the most common measure of internal consistency ("reliability"). It is most commonly used when you have multiple Likert questions in a survey/questionnaire that form a scale and you wish to determine if the scale is reliable.

#### Example

A researcher has devised a nine-question questionnaire to measure how safe people feel at work at an industrial complex.

### 1.5 Cronbach's Alpha

Cronbach's alpha coefficient measures the internal consistency, or reliability, of a set of survey items. Use this statistic to help determine whether a collection of items consistently measures the same characteristic. Cronbach's alpha quantifies the level of agreement on a standardized 0 to 1 scale. Higher values indicate higher agreement between items [11].

#### 1.5.1 High Values

High Cronbach's alpha values indicate that response values for each participant across a set of questions are consistent. For example, when participants give a high response for one of the items, they are also likely to provide high responses for the other items. This consistency indicates the measurements are reliable and the items might measure the same characteristic.

#### 1.5.2 Low Values

Conversely, low values indicate the set of items do not reliably measure the same construct. High responses for one question do not suggest that participants rated the other items highly. Consequently, the questions are unlikely to measure the same property because the measurements are unreliable.

#### 1.5.3 Cronbach's alpha ranges from 0 to 1

- **Zero** indicates that there is no correlation between the items at all. They are entirely independent. Knowing the value of a response to one question provides no information about the responses to the other questions.
- **One** indicates that they are perfectly correlated. Knowing the value of one response provides complete information about the other items.

#### 1.5.4 Acceptable range for Cronbach's alpha

Analysts frequently use 0.7 as a benchmark value for Cronbach's alpha. At this level and higher, the items are sufficiently consistent to indicate the measure is reliable. Typically, values near 0.7 are minimally acceptable but not ideal.

### 1.6 Some AI-Related Research in HRM

There have been some attempts at AI adaptation for HR.

Ismail et al. concluded that only large companies are adopting AI in recruitment, and to what extent they are using it is still unclear. So, it is not clear which techniques or methods are being used in AI for recruitment currently [12].

Mihuandayani et al. created a machine learning algorithm using SVM for personality profiling of candidates on social media platforms. They obtained 64.5% classifying accuracy for five classes (personality types) [13].

As the ROC, AUC, and confusion matrix were not given, 64.5% accuracy is not sufficient to conclude whether the model was successful or not. More importantly, using personality types is not a sufficient selection criterion for recruitment. Another research was made by Qiangwei and colleagues. Data (about HR features) were collected by questionnaire survey. Affinity propagation (AP) and SVM were used for creating a new feature selection algorithm. They reduced 24 features with the new model to 12 features and increased accuracy from 84.98% to 85.84% [14].

On the other hand, Yung-Ming executed research for recruitment using the SVM learning algorithm. Data were collected through personality surveys of current employees and candidates. Even though conventional thinking suggests that skill score is of greater importance than personality, their research finds that personality is a key factor in evaluating an employee for a position [15].

## II Literature Review

**Herzberg (1968)** believes that corporate culture forms and develops in parallel with the development of enterprises, not only a communication culture but also includes core values, rules, and regulations. , management style, business method, and attitude of all enterprise members.

**Kovach (1987)** argues that performance appraisal is an important human resource management activity and always exists in every organization

**Jarratt & Neill (2002)** argue that human resource training and development is an organized activity carried out over a certain period. This activity aims to improve the staff's professional skills, overcome shortcomings, and improve work productivity (Adams, 1965).

**According to Abzari & Sadri (2011)**, motivation has many interpretations. Motivation is the reason for performing a behavior," or "motivation is what motivates people to do or not to do something. However, in much literature on human resource management or organizational behavior, motivation is understood as a person's desire and willingness to achieve a particular goal or result. Motivation is the internal factor that stimulates people to work hard in permissible conditions, creating high productivity and efficiency [8].

**Irena (2012)** states that the support of leaders and colleagues shows that employees are always respected, trusted, and essential members of the organization.

**According to Edlund & Nilsson (2013)**, loyalty is also reflected in job satisfaction and dedication to work [9].

**According to Adedeji & Ugwumadu (2018)**, loyalty always creates motivation from within the individual to meet unsatisfied needs. Employee loyalty is the willingness to demonstrate a high degree of effort towards organizational goals. On the condition that some personal needs are satisfied according to their efforts, they become loyal employees, agreeing with the business [10].

**Hitka et al. (2019)** also believe that salary and benefits show that employees receive a salary commensurate with work results, a wage that ensures personal life, and is rewarded or increased when they work a good job.

**Gupta (2020)** argues that salary and benefits are considered one of the rights of employees under the protection of the law and the State.

**Javed et al. (2020)** believe that the working environment is necessary for employees to complete work quickly and efficiently.

**Karimah et al. (2021)** researched that in the corporate environment, the close relationship with leaders and colleagues is the connecting link that helps employees understand and coordinate smoothly at work

## III Methodology

The following steps are followed

Step 1 : The authors got data from 200 workers working at enterprises in Dong Nai province, Vietnam.

Step 2 : Apply raw data for Cronbach's Alpha

Step 3 : Apply step 2 for the following Components of Motivation and Loyalty :

- (i) Salary and Benefits (SAB)
- (ii) Training and Developing (TAD)
- (iii) Working Environment (WE)
- (iv) Performance Appraisal (PA)
- (v) Leadership and Colleague support (LACS)
- (vi) Corporate Culture (CC)
- (vii) Social Responsibility (SR)
- (viii) Management Capacity (MC)

Step 4 : Consider only the highest Cronbach’s Alpha for each component of step 3

Step 5 : Use AI Tool called : ChatGPT 3.5 [16] to know the outcomes of step 4

Step 6 : Note the outcome for each of the component of step 3 with ChatGPT

Step 7 : Conclude from step 6

#### IV Results and Discussions

##### 4.1 Results

After following the methodology in section III, we receive the following results for step3 and step 6

##### 4.1.2 For the component Salary and Benefits (SAB)

Step 3 : Table 1

Cronbach's Alpha from elements of salary and benefits (SAB)						
Contents	Code	Scale Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Wages are commensurate with employees' work results	SAB 1	9.4973	7.219	0.749	0.906	0.912
Workers can live entirely on salary	SAB 2	9.3514	7.392	0.763	0.899	
Wages are paid fairly, clearly, and helpfully	SAB 3	9.2757	7.44	0.848	0.872	
I receive good benefits in addition to salary such as insurance, travel expenses, travel	SAB 4	9.3351	7.126	0.852	0.868	

Step 6 : Outcome for SAB



GA Cronbach's Alpha from elements of salary and benefits with the highest is 0.912

That's a high Cronbach's Alpha value of 0.912, which indicates strong internal consistency among the elements of salary and benefits that were measured. This suggests that the items you included in your measurement of salary and benefits are highly correlated with each other, and they are likely measuring the same underlying construct effectively. This is a positive outcome when assessing the reliability of a scale or questionnaire. If you have any more questions or need further information about Cronbach's Alpha or anything else related to your studies, feel free to ask!

##### 4.1.3 For the Component Training and Developing (TAD)

Step 3 : Table 2

Cronbach's Alpha from training and developing (TAD)						
Contents	Code	Scale Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
You are trained, professional development	TAD 1	10.3676	5.408	0.626	0.787	0.823
The company gives you many opportunities for personal development	TAD 2	10.3135	4.89	0.67	0.766	
There are many advancement opportunities in the company	TAD 3	10.3838	4.944	0.644	0.799	
Clear, transparent, and fair promotion policy	TAD 4	10.3676	5.147	0.649	0.776	

Step 6 : Outcome for TAD



GA Cronbach's Alpha from elements of training and developing with the highest is 0.823

That's great to hear that you're discussing Cronbach's Alpha in the context of training and development elements. Cronbach's Alpha is a measure of internal consistency reliability, often used to assess the reliability of a scale or questionnaire. An Alpha value of 0.823 suggests that the items in your assessment have a relatively high level of internal consistency, which is generally considered a good sign for the reliability of your measurement tool. If you have any specific questions or need further information about Cronbach's Alpha or its application in training and development, feel free to ask!

##### 4.1.4 For the Component Working Environment (WE)

Step 3 : Table 3

Step 6 : Outcome for WE

Default (GPT-3.5) ⓘ

GA Cronbach's Alpha from elements of working environment with the highest is 0.924

That's a strong Cronbach's Alpha value of 0.924, indicating high internal consistency among the elements of the working environment you studied in your research. If you have any questions or need further information about Cronbach's Alpha or your study, feel free to ask.

4.1.5 For the Component Performance Appraisal (PA)

Step 3 : Table 4

Cronbach's Alpha from performance appraisal (PA)						
Contents	Code	Scale Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Enterprises have criteria to evaluate work results and accurately reflect the work results of employees	PA 1	6.5351	3.185	0.704	0.717	0.816
Enterprises evaluate work results fairly, openly, and objectively	PA 2	6.6703	2.929	0.699	0.713	
The enterprise always organizes to give suggestions on the performance of work and the results of work completion	PA 3	6.8919	2.945	0.61	0.812	

Step 6 : Outcome for PA

Default (GPT-3.5) ⓘ

GA Cronbach's Alpha from elements of performance appraisal with the highest is 0.816

That's great to hear that you're interested in Cronbach's Alpha, which is a measure of internal consistency in data. If you have specific questions or need assistance related to Cronbach's Alpha or anything else related to your studies in B.Tech, please feel free to ask, and I'll be happy to help!

4.1.6 For the Component Leadership and Colleague support (LACS)


Step 3 : Table 5

Cronbach's Alpha from elements of leadership and colleague support (LACS)						
Contents	Code	Scale Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Business leaders always care, support, and help in times when employees have difficulties	LACS 1	10.027	6.157	0.478	0.804	0.808
Business leaders always listen to the views and thoughts of employees	LACS 2	9.8649	5.226	0.614	0.766	
Business leaders are skillful and tactful when giving criticism to employees	LACS 3	9.9838	6.31	0.473	0.805	
Colleagues are often willing to help each other and support each other	LACS 4	9.9189	5.031	0.79	0.71	
Colleagues are amiable and work well together	LACS 5	9.8054	4.984	0.644	0.757	

Step 6 : Outcome for LACS

Default (GPT-3.5) ⓘ

**GA** Cronbach's Alpha from elements of Leadership and Colleague support (LACS) with the highest is 0.808

 That's a good Cronbach's Alpha value for your Leadership and Colleague Support (LACS) elements, with a score of 0.808. This indicates a high level of internal consistency reliability for your questionnaire items related to these constructs. It suggests that the items you've used to measure Leadership and Colleague Support are closely related and consistently measure the same underlying construct. This can be a positive sign for the reliability of your measurement instrument. If you have any specific questions or need further assistance regarding your research or data analysis, please feel free to ask.

### 4.1.7 For the Component Corporate Culture (CC)


Step 3 : Table 6

Cronbach's Alpha from corporate culture (CC)						
Contents	Code	Scale Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Enterprises determine the core values of the business: mission, vision, and goals	CC 1	6.6162	3.39	0.679	0.821	0.847
Announce and communicate corporate culture to all employees	CC 2	6.7892	2.95	0.795	0.708	
Employees are empowered and creative at work	CC 3	6.9081	3.117	0.678	0.825	

Step 6 : Outcome for CC

Default (GPT-3.5) ⓘ

**GA** Cronbach's Alpha from elements of Corporate Culture with the highest is 0.847

 It's great to hear that you're interested in Cronbach's Alpha and its application to elements of corporate culture. Cronbach's Alpha is a measure of internal consistency reliability and is often used to assess the reliability of a set of items or questions in a questionnaire or survey.

In your case, you mentioned that the highest Cronbach's Alpha you obtained for elements of corporate culture is 0.847. This suggests that the items you used to measure these elements are internally consistent, meaning they are likely measuring the same underlying construct reliably.

If you have any specific questions or need further information about using Cronbach's Alpha in the context of corporate culture research, feel free to ask!

### 4.1.8 For the Component Social Responsibility (SR)


Step 3 : Table 7

Cronbach's Alpha from social responsibility (SR)						
Contents	Code	Scale Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Enterprises always aim to improve the better working environment	SR 1	9.3243	7.416	0.85	0.891	0.923
Businesses always provide honest information to customers	SR 2	9.3081	7.551	0.791	0.911	
The business always supports local sports and cultural activities	SR 3	9.2378	7.824	0.827	0.899	
Local and other community-based projects	SR 4	9.3459	7.217	0.826	0.899	

Step 6 : Outcome for SR

Default (GPT-3.5) ⓘ

**GA** Cronbach's Alpha from elements of Social Responsibility with the highest is 0.923

 That's great to hear that you've calculated Cronbach's Alpha for elements of Social Responsibility, and it's showing a high reliability score of 0.923. This indicates that the elements you measured are internally consistent and reliable for assessing social responsibility. If you have any specific questions or need further assistance related to this topic, please feel free to ask.

### 4.1.9 For the Component Management Capacity (MC)

Step 3 : Table 8

Cronbach's Alpha from management capacity (MC)						
Contents	Code	Scale Mean if Item Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Leaders have a strategic vision and create a good working environment	MC 1	7.3514	2.729	0.549	0.633	0.718
Leadership inspires and motivates employees	MC 2	7.1081	2.564	0.47	0.685	
Solve problems quickly and efficiently	MC 3	7.2595	2.911	0.452	0.687	
Leaders know how to use human resources effectively	MC 4	7.3405	2.628	0.567	0.62	

Step 6 : Outcome for MC

Default (GPT-3.5) ⓘ

GA Cronbach's Alpha from elements of Management Capacity with the highest is 0.718

That's a good Cronbach's Alpha score for elements of Management Capacity, which indicates a reasonable level of internal consistency among the items you measured. It suggests that the items you used to assess Management Capacity are moderately reliable in capturing the construct you're interested in studying. If you have any specific questions or need further assistance related to this topic, feel free to ask.

### 4.2 Discussions

From the tables 1 to 8, we find two important colored element values, one is about deleted value, represents the lowest (Red color) and considered the Cronbach's Alpha highest (Green color) value for outcome purpose. Where the highest value for each component says about the reliability or consistency. To analyze this, we have used an AI Tool called ChatGPT of version 3.5. For each component, we found the outcome through this tool and gave us the reasonable level of internal consistency among items we measured.

### V Conclusion

To learn about Sustainable Human Resource Management, we have used an AI Tool called ChatGPT, for various components mentioned in the methodology of step 3, with their highest values. And found from this chatGPT of AI Tool, that these highest values of Cronbach's Alpha are necessary for consistency. As the literature says that, for reliability, highest values of cronbach's alpha are required. This requirement of highest scores is understood with the help of AI Tool as an outcome for Sustainable Human Resource Management.

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