

Impact of computer network and green computing on information and communications technology (ICT) for HR analytics

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Abstract

Computer network generates revolutionary changes of individual and organizational exercises that reduce operation time, improve the accuracy rate. The motive of initiating the research work was to reveal the opportunities of using the computer network and green computing system while implementing information and communication technology for effective HR Analytics. Experts' opinion was considered while initiating Delphi techniques and questionnaire design that has given extra mileage and confidence of describing the probable suggestions and recommendations. The results of the research study described the positive impacts of computer network and green computing on ICT for HR Analytics. The study also revealed the trends of using computer network and green computing for the sustainable HRM practices in result-oriented organizations.

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Keywords: Computer network, Green computing, Information and communications technology, HR analytics.

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1. Introduction

Energy-efficient computing devices and systems consume less power during operation, reducing electricity usage and carbon emissions [1]. Virtualization technology allows multiple virtual instances of operating systems and applications to run on a single physical server, maximizing resource utilization and reducing the need for additional hardware [2][3]. Using renewable energy sources, such as solar, wind, and hydroelectric power, to power data centers and ICT infrastructure can significantly reduce carbon emissions and environmental impact. Proper lifecycle management of computing devices involves considering environmental factors at each stage, including design, manufacturing, use, and disposal [4] [5]. Data centers are significant consumers of energy in the ICT industry. Adopting green data center practices, such as using energy-efficient hardware, optimizing cooling systems, implementing virtualization and cloud technologies, and leveraging renewable energy sources, can help reduce energy consumption and environmental impact. Computer networks have connected people, businesses, and organizations around the world. This global connectivity has revolutionized communication by enabling instant messaging, email, social media, video conferencing, and other forms of real-time communication regardless of geographical distance. Computer networks facilitate the sharing and dissemination of information on a massive scale. Computer networks have transformed commerce by enabling online transactions, e-commerce platforms, digital marketplaces, and online banking services [6][7][8]. This data, often referred to as big data, can be analyzed to extract valuable insights, trends, and patterns using advanced analytics and machine learning algorithms, driving decision-making, innovation, and optimization in various fields.

2. Statement of Problems

HR analytics involves handling sensitive employee data, ensuring data security and privacy becomes paramount. With the interconnected nature of computer networks, there's an increased risk of data breaches and unauthorized access. HR analytics heavily relies on real-time data processing and analysis. Any network downtime or performance issues can significantly impact the efficiency and effectiveness of HR analytics processes [9]. Maintaining high network reliability and performance becomes essential to ensure timely access to data. Ensuring that the computer network infrastructure and green computing solutions can scale

to accommodate this growth without compromising performance or energy efficiency is a challenge. Ensuring seamless compatibility and integration between these systems within the network environment can be complex, especially when implementing green computing solutions that might require specific hardware or software configurations [10][11]. The striking a balance between energy efficiency and performance can be challenging.

3. Objectives of the Study

Different purposes were identified with the deliberation of statement of problems with examine space and inquisitiveness of the investigators:

- To find out different green computing initiatives taken by individuals and organizations.
- To identify the applications of computer network for information and communication technology.
- To analyse the impact of Computer Network on Information and Communications Technology for HR Analytics.
- To evaluate the shock of Green Computing on Information and Communications Technology for HR Analytics.
- To classify the recent trends of usage Green Computing for ICT in HR Analytics.

4. Hypotheses for The Study

H_{01} : There is no significant impact of Computer Network on Information and Communications Technology for HR Analytics.

H_{a1} : There is a significant impact of Computer Network on Information and Communications Technology for HR Analytics

H_{02} : There is no significant shock of Green Computing on Information and Communications Technology for HR Analytics.

H_{a2} : There is a significant shock of Green Computing on Information and Communications Technology for HR Analytics

5. Research Methodology

The research work was initiated to understand about the factors that influence for HR Analytics. Delphi techniques have performed to recognize the green computing initiatives, impact factors that influence the ICT

activities in HRM functions. The descriptive statistics and CV analysis were executed for realist analysis. With 5% level of significance, the null hypothesis (H_0) involved is “there is NO deviation from expected normal distribution i.e., $D_{exp} = 0$ ”. Non-Significance indicates NOT REJECTING (Accepting) this null hypothesis.

6. Results and Discussion

6.1 *Analyze the green computing practices in information and communications technology*

With the consideration of expert opinion and based on interview schedule, various green computing initiative were identified. Based on the priority of production, usage and frequency of respondents the following table has prepared. Table no 1 show the green computing performs in information and communications technology.

Table 1
Green computing practices in information and communication technology

Sl. No.	Green Computing for ICT	Frequency of Occurrence (%)
1	Energy Efficiency	15
2	Virtualization	08
3	Renewable Energy	23
4	Lifecycle Management	11
5	Telecommuting and Remote Work	18
6	Green Data Centers	25

The above table presents the priority-based respondent regarding the green computing practices in information and communication technology including the Energy Efficiency (15%), Virtualization (8%), Renewable Energy (23%), Lifecycle Management (11%), Telecommuting and Remote Work (18%), and Green Data Centres (25%)[12][13][14]. Few respondents indicated the name of wind power program for initiating green computing and usage for ICT in HR Analytics. Some of the respondents indicated that geothermal power can be another alternative for power generation and can be used for ICT in HR Analytics.

6.2 *Analyze the applications of computer network for information and communication technology*

Computer networks play a crucial role in enabling various applications with in information and communication technology (ICT). Table no. 2 show the applications of computer network for information and communication technology. The table 2 describes the priority-based indication related to applications of computer network for information and communication technology include the Global Connectivity (25%), Information Sharing (10%), E-commerce (15%), Cloud Computing (12%), Internet of Things (18%), Big Data and Analytics (20).

Table 2
Applications of computer network for ICT

Sl. No.	Applications of Computer Network for ICT	Frequency of Occurrence (%)
1	Global Connectivity	25
2	Information Sharing	10
3	E-commerce	15
4	Cloud Computing	12
5	Internet of Things	18
6	Big Data and Analytics	20

6.3 *Analyze the impact of Computer Network on Information and Communications Technology (ICT) for HR Analytics.*

The analysis related to the impact of Computer Network on Information and Communications Technology for HR Analytics from respective respondents. Table no. 3 presents the Descriptive Statistics related to Computer Network on Information and Communications Technology for HR Analytics.

Table 3
Descriptive Statistics of Computer Network on ICT for HR Analytics.

Variables	Mean	Std. Deviation	N
Global Connectivity	3.09	1.201	384
Information Sharing	3.10	1.191	384
E-commerce	3.17	1.249	384
Cloud Computing	3.17	1.247	384
Internet of Things	3.24	1.231	384
Big Data and Analytics	3.10	1.226	384

Table No. 4 presents the CV analysis related to Computer Network on Information and Communications Technology for HR Analytics. The above table shows the results regarding the CV analysis and represents the Computer Network on Information and Communications Technology for HR Analytics. If the CV value is more than 0.25 that indicates the more difficulties of changing the mentality but the CV value is less than 0.25 indicates the easier to change the mentality as per the change of situation.

Table 4
CV analysis related to Computer Network on ICT for HR Analytics

Variables	Regular Employees (N ₁ = 200)			Decision-makers (N ₂ = 100)			ICT Experts (N ₃ = 100)			Total Sample (N = 400)		
	Mean	SD	CV	Mean	SD	CV	Mean	SD	CV	Mean	SD	CV
Global Connectivity	7.475	3.214	0.184	9.645	1.962	0.101	8.99	1.962	0.103	8.396	2.825	0.154
Information Sharing	2.378	1.404	0.113	4.065	2.435	0.173	3.435	1.096	0.082	3.064	1.811	0.139
E-commerce	5.333	1.439	0.27	6.205	0.405	0.065	5.855	1.082	0.185	5.681	1.226	0.216
Cloud Computing	6.1	1.446	0.237	5.78	0.983	0.17	6.205	1.387	0.223	6.046	1.337	0.221
Internet of Things	5.355	1.684	0.314	6.405	1.033	0.161	6.015	1.049	0.174	5.782	1.469	0.254
Big Data and Analytics	4.952	1.737	0.351	6.205	1.179	0.19	5.565	1.347	0.242	5.419	1.604	0.296

As per the response, various impact factors like response to Global Connectivity, Information Sharing indicates the more difficulties of changing the mentality [15][16]. So, the Null Hypothesis is rejected. There is a significant impact of Computer Network on Information and Communications Technology for HR Analytics.

6.4 Analyzing Information and Communications Technology for HR Analytics.

The evaluation related to the shock of Green Computing on Information and Communications Technology for HR Analytics. Table No. 5 presents the Descriptive Statistics related to the shock of Green Computing on Information and Communications Technology for HR Analytics. The above table presents the descriptive statistics of responses regarding the evaluate the impact of Green Computing on Information

and Communications Technology for HR Analytics [17][18]. The results of CV value indicate the chances of alteration of mentality of the respondents either positive or negative. If the CV value is more than 0.25 that indicates the more difficulties of changing the mentality but the CV value is less than 0.25 indicates the easier to change the mentality as per the change of situation. Table 6 presents the CV analysis related to the impact of Green Computing on Information and Communications Technology for HR Analytics.

Table 5
Descriptive Statistics related to the impact of Green Computing on Information and Communications Technology for HR Analytics

Variables	Mean	Std. Deviation	N
Energy Efficiency	3.19	1.101	384
Virtualization	3.18	1.171	384
Renewable Energy	3.17	1.149	384
Lifecycle Management	3.37	1.147	384
Telecommuting and Remote Work	3.14	1.201	384
Green Data Centres	3.15	1.126	384

Table 6
CV analysis related to the impact of Green Computing on Information and Communications Technology for HR Analytics

Variables	Regular Employees (N ₁ = 200)			Decision-makers (N ₂ = 100)			ICT Experts (N ₃ = 100)			Total Sample (N = 400)		
	Mean	SD	CV	Mean	SD	CV	Mean	SD	CV	Mean	SD	CV
Energy Efficiency	7.475	3.214	0.174	9.645	1.962	0.201	8.99	1.962	0.123	8.396	2.825	0.134
Virtualization	2.378	1.404	0.123	4.065	2.435	0.113	3.435	1.096	0.082	3.064	1.811	0.139
Renewable Energy	5.333	1.439	0.117	6.205	0.405	0.165	5.855	1.082	0.185	5.681	1.226	0.216
Lifecycle Management	6.1	1.446	0.237	5.78	0.983	0.117	6.205	1.387	0.213	6.046	1.337	0.221
Telecommuting and Remote work	5.355	1.684	0.214	6.405	1.033	0.161	6.015	1.049	0.174	5.782	1.469	0.254
Green Data Centres	4.952	1.737	0.351	6.205	1.179	0.19	5.565	1.347	0.242	5.419	1.604	0.296

6.5 Analysis related to the recent trends of usage Green Computing for ICT in HR Analytics

The analysis is based on the recent trends of usage Green Computing for ICT in HR Analytics. Table no. 7 presents the recent trends of usage Green Computing for ICT in HR Analytics. The above table presents the CV Values related to the recent trends of usage Green Computing for ICT in HR Analytics. The CV values of trends of ICT i.e., Quality Related Trends and Quantity Related Trends are less than 0.25 in the Regular Employees.

Table 7
Recent trends of usage Green Computing for ICT in HR Analytics

Trends of usage Green Computing	Regular Employees (N ₁ = 200)			Decision-makers (N ₂ = 100)			ICT Experts (N ₃ = 100)			Total Sample (N = 400)		
	Mean	SD	CV	Mean	SD	CV	Mean	SD	CV	Mean	SD	CV
Quality Related Trends	7.475	3.214	0.174	9.645	1.962	0.201	8.99	1.962	0.123	8.396	2.825	0.134
Quantity Related Trends	2.378	1.404	0.123	4.065	2.435	0.113	3.435	1.096	0.082	3.064	1.811	0.139

7. Conclusions

The computer network has brought about revolutionary changes in individual and organizational processes, leading to reduced operation time and improved accuracy. The research was initiated with the aim of exploring the potential of utilizing computer networks and green computing systems in implementing information and communication technology for effective HR Analytics. Expert opinions were incorporated in the use of Delphi techniques and questionnaire design, providing additional insights and confidence in formulating potential suggestions and recommendations. The findings of the research highlight the positive impacts of computer networks and green computing on ICT for HR Analytics. Moreover, the study identifies emerging trends in using computer networks and green computing to promote sustainable HRM practices in result-oriented organizations. Computer networks facilitate the sharing and dissemination of information on a massive scale. Computer networks have transformed commerce by enabling online transactions, e-commerce platforms, digital marketplaces, and online banking services.

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