



## Study and Analyze the Factors Related to Green Computing

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**Abstract - In today's era computer is the basic need of everyone. Everyone use computer for its own purpose. But no one is aware about the harmful impacts of the use of computer on environment. Most of the CO<sub>2</sub> emission is produced through the heat generated by computer and its devices. The energy consumption by various computing devices is also plays a main role towards our harmful environment. This research paper analyzes the factors related to awareness of green computing among common man. It also includes a survey questionnaire which takes all the factors into account and before starting actual survey a pilot study for this questionnaire was done which confirm its acceptance.**

**Keywords – Environment, hazardous, manufacturer, CO<sub>2</sub> emission, sustainable**

### I. Introduction

Green computing is the study of environmental sustainable computing. It is the study and practice of designing, manufacturing, using, and disposing of computers efficiently and effectively with minimal or no impact on the environment. The goal of green computing is to reduce the use of hazardous material and save our environment from its harmful impacts. CO<sub>2</sub> emission also plays a big role to affect our environment and most of CO<sub>2</sub> emission is produced through the use of computer and its devices. Although computer is the basic need of every common man and they have to use it for time saving and to reduce human labour, but they also need to aware about its harmful impacts on our environment. In this research paper we take various factors related to the awareness of green computing also to check the every common man's knowledge about green computing and initiatives towards green computing taken through computer manufacturers and also taken by a common man.

### II. Factor Categories

This questionnaire considers all the factors related to term green computing, its benefits and the initiatives of computer manufacturers and of common man towards green computing. All these factors are taken according to their suitable priority. It includes major factors and all these factors are taken as questions which can be answered in yes, no or don't know according to which we can easily consider the benefits and awareness of green computing towards common man so they can use their computer and its devices which are more sustainable to our environment and take some efforts to save our environment from the harmful impacts of CO<sub>2</sub> emission and hazardous material.

### III. Classifiers

According to the factors in the questionnaire the respondents can be classified in broad four classifiers, those are following.

- A. Students
- B. Employees
- C. Employers
- D. Common man

### IV. Category Factor Variables

General terms

- V1 (Do you use computer?)
- V2 (Do you have laptop?)
- V3 (Do you have desktop?)
- V4 (Have you more than one computer?)
- V5 (Do you use screensavers on your computer?)
- V6 (Are you are using computer from a long time?)
- V7 (Are you are using computer more than 5 hour per day?)
- V8 (Have you lesser printer?)
- V9 (Have you inkjet printer?)
- V10 (Do you ever use other computing devices such as printer and scanner?)

Awareness

- V11 (Do you care about environment?)

- V12 (Do you know about the term green computing?)
- V13 (Do you know about the benefits of green computing?)
- V14 (Do you turn off your computer when it is not in use?)
- V15 (Do you know about the harmful impact of use of computers?)
- V16 (Do you know about energy star program?)
- V17 (Do you know about energy efficient products?)
- V18 (Do you know about carbon emission (CO<sub>2</sub>) generated by computers and its devices?)
- V19 (Do you know CO<sub>2</sub> emission cause impact on our environment like acid rain, global warming?)
- V20 (Do you know about operating systems that consume less energy?)
- V21 (Have you ever use Linux operating system?)
- V22 (Do you know which search engine consumes less energy?)
- V23 (Are you aware about the companies' initiatives toward green computing?)
- V24 (Do you know which manufacturer's product is more sustainable to our environment?)
- V25 (Do you know about e-waste generated from computing equipment?)
- V26 (Have you ever seen or heard about any campaign about green computing?)
- V27 (Telecommuting is a way companies can make their office greener?)
- V28 (Green computing equipment is so expensive so that small business cannot afford it.)

#### Recycling and disposing

- V29 (Do you know about disposing of computers and its devices?)
- V30 (Do you know about formal and informal disposing?)
- V31 (Do you know about the recycling of the computers?)
- V32 (Do you ever recycle any computing device?)

#### Energy Consumption

- V33 (When you purchase new electronic device do you consider energy star logo?)
- V34 (You have any product with energy star logo?)
- V35 (You are doing efforts to saving energy at home?)
- V36 (You always consider about cost while purchasing product?)
- V37 (Can you save a lot of money by using green computing?)
- V38 (Is Laptop consumes less energy than desktops?)
- V39 (Is Inkjet printer more sustainable to environment than lesser jet?)
- V40 (Does Screen saver save energy when computer is idle?)
- V41 (Is Linux a less energy consuming operating systems?)
- V42 (Constantly shutting down and restarting your computer during the day would consume more energy than just leaving it running.)

#### Disposing and recycling

- V43 (Have you ever disposed any computing devices?)
- V44 (Is informal disposing harmful?)
- V45 (Is Formal disposing costly?)
- V46 (Is Formal disposing sustainable to our environment?)
- V47 (Recycling printer cartridge is greener than refilling them.)
- V48 (Do you know there is less no. of plants for formal disposing in our country?)
- V49 (Recycling any computer storage devices is a bad idea, because the data on them can be used by unscrupulous people?)

#### E- waste

- V50 (Is there any computer manufacturer that takes any initiatives to reduce e-waste?)
- V51 (It is better to use your computing equipment as long as possible ,to keep it from becoming e-waste?)

### V. Conclusion

Green computing is the study and practice of designing, use and disposing of computer and its devices with no and minimal impacts on our environment. Today awareness about the benefits of green computing and the use of environmentally sustainable products is must to aware the common man about the present state of our environment and to save it from the harmful impacts of CO<sub>2</sub> emission. This questionnaire includes the various factors that help to aware the common man about the benefits of green computing towards sustainable environment. These factors must be considered to force the user to use environmentally sustainable products and also take efforts towards green environment as much as possible. According to the survey results the priority of factor variables can be set and actions must be taken accordingly.

### References

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Dr. Pardeep Mittal is Ph.D. in Computer Science & Engineering, M.Tech in Information Technology and an alumnus of NIT-Jalandhar where he has done his B.Tech in computer science & engineering. He has also finished his PGDBM. He is a life member of Indian Society of Technical Education (ISTE) & Punjab Academy of Sciences (PAS). He has 14 years of teaching experience. He has started his teaching career as a lecturer from a renewed Engineering College of Punjab. Then he was promoted to Assistant Professor, Associate Professor and now he has been working as Professor and Dean in Guru Kashi University, Talwandi Sabo, Punjab, India. He has served as Director (Academia) for a reputed college in Bathinda, Punjab, India. He is the guide of Ph.D. and M.Phil research scholars. His 15 research papers are already published.



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**Annexure**

A questionnaire on survey of Green Computing

Please take few minutes to fill out the survey. We welcome your feedback and your answer will be kept confidential.

<b>Two Options Variables</b>		
Statements	Yes	No
V1(Do you use computer?)		
V2(Do you have laptop?)		
V3(Do you have desktop?)		
V4(Have you more than one computer?)		
V5(Do you use screensavers on your computer?)		
V6(Are you are using computer from a long time?)		
V7(Are you are using computer more than 5 hour per day?)		
V8(Have you lesser printer?)		
V9(Have you inkjet printer?)		
V10(Do you ever use other computing devices such as printer and scanner?)		
V11(Do you care about environment?)		
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V26(Have you ever seen or heard about any campaign about green		

computing?)			
V27(Telecommuting is a way companies can make their office greener?)			
V28(Green computing equipment is so expensive so that small business cannot afford it.)			
V29(Do you know about disposing of computers and its devices?)			
V30(Do you know about formal and informal disposing?)			
V31(Do you know about the recycling of the computers?)			
Three Options Variables			
Statements	Yes	No	Don't Know
V32(Do you ever recycle any computing device?)			
V33(When you purchase new electronic device do you consider energy star logo?)			
V34(You have any product with energy star logo?)			
V35(You are doing efforts to saving energy at home?)			
V36(You always consider about cost while purchasing product?)			
V37(Can you save a lot of money by using green computing?)			
V38(Is Laptop consumes less energy than desktops?)			
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V48 (Do you know there is less no. of plants for formal disposing in our country?)			
V49 (Recycling any computer storage devices is a bad idea ,because the data on them can be used by unscrupulous people?)			
V50 (Is there any computer manufacturer that takes any initiatives to reduce e-waste?)			
V51 (It is better to use your computing equipment as long as possible, to keep it from becoming e-waste?)			

PERSONAL INFORMATION

By Students

Regular Student	Distance Education Student
Gender.....	Age..... <input type="checkbox"/> .....
City.....	Name of Study C <input type="checkbox"/> /University.....
Name (optional).....	Contact Number(optional).....
Stream.....	Course..... UG/PG

By Employees

Name of Organization.....
Name of Employee (optional).....
Designation.....
Contact No. (optional).....
Work Area.....

By Employers

Name of Organization.....
Employer Strength.....
Name of Employer.....
Designation.....
Contact Number(Optional).....

By Common Man

Name (optional).....	Age.....	Gender.....
Qualification.....	Contact No. (optional).....	
Occupation .....		