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Usability Experience Design, Cloud Computing and Green Computing: Take a Look of these Emerging Field of Information Sciences

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Abstract **- Information Science is one of the important and responsible subjects of social change. From traditional partial information centered subject to information science all subjects are treated as vital applied science. The main aim of information science is information activities with the help of tools, techniques and technologies. During 1970-90'S information science dealt only with indexing, user studies, knowledge management internet, web, automation, digitalization, Knowledge society, but today many subjects and emerging areas make information science a techno-management subject which is considered for social engineering. Green computing and cloud computing are the most important areas of information science for digitalization and virtualization of Information Technology products keeping in mind eco-friendliness and energy management. Though user experience design to some extent is related to web design and development but truly it is fully related to usability engineering. Usability Engineering is also responsible for good user interface design based on user need and demand. This paper describes all the emerging areas of information science, with special reference to cloud and green computing and usability engineering.**
Keywords: **Usability, Usability Engineering, User Experience Design, Green Computing, Green Technologies, Energy Management, Eco Friendliness, Cloud Computing, Virtualization, Advance Computing.**

I.INTRODUCTION

Science and Technology are changing day by day, advancement of innovation and experiment has given us so many tools and products [09]. Usability Experience Design is actually sub field or area of Usability Engineering which mainly deals with so many aspects of interface designing and development. Fundamentally usability experience design is nothing but a way to develop better usable interface [18]. Cloud computing is able to create all the information technology product and service under one roof almost all the time through the virtualization method [02].

In cloud computing sharing of hardware, software, application is possible efficiently and effectively. Green Computing is another area of advance computing, which talks about how to design and develop green-friendly computing and information technological systems through the energy and power management mechanism. These three components or emerging areas are closely associated with each other [12].

II.OBJECTIVES

The main aims and objectives of this research work are

1. To learn the basics about information science- from earlier traditional field to emerging applied fields.
2. To know the basics about Green computing and its related areas
3. To learn the basics about Cloud computing and its uses in information science.
4. To learn the basics about in Cloud computing and green computing and emerging challenges.
5. To learn the role and need of usability and User experience design and its relationship with information science practice areas.

III.INFORMATION SCIENCE: FROM PAST TO EMERGING SCENARIO

Information science is a kind of subject which mainly deals with information collection, selection, organization and dissemination. However, indirectly this subject deals with management and manipulation of information. Information Science is a type of discipline which centers round information with the help of various kinds of tools and technologies like database technologies, networking technologies, communication technologies, and multimedia technologies. Initially Information Science was considered as a Social Science but due to its interdisciplinary nature and time need, the traditional information science has totally changed to an Applied Science and technological discipline [10, 11]. Now let us discuss the flavors of information science from the earlier to the emerging concept:-

IV.USABILITY EXPERIENCE DESIGN AND INFORMATION SCIENCE

Usability Experience Design falls under Usability Engineering. Information Science has close relationship with usability experience design [04, 18]. Usability experience design is actually design and development of webpage, interface, Graphical User interface, Information Retrieval System as per usability and user need. As usability experience design and development are essential for

improved information dissemination; it has a close relationship with Information Science [10].

In between 1960'S-70'S	In between 1980'S-1990	**In Between 2000-Till date**
-Information Organization.	**-Information & Knowledge Society**	**-Knowledge Economy.**
-Knowledge Organization.	**-Information Management.**	**-Information Architecture.**
-Documentation.	**-Knowledge Management.**	**-Multimedia Infosys.**
-Indexing.	**-Automation.**	**-Information Networks.**
-Abstracting.	**-Digitalization.**	**-Virtualization.**
-Information Theory.	**-Networking.**	**-Cloud Computing.**
-Information & Society.	**-Internet Technology.**	**-Usability Engineering.**
-Bibliometrics.	**-SWOT Analysis in Information Systems.**	**-Green Computing.**
-Librametrics	**-Strategic Management in Information Systems.**	**-TQM**
-Principle of Information.		**-Human Computer Interaction**
		-Leadership.
		-Web Engineering

Fig.1 Information Science & its emerging trends

Information Science is mainly dedicated to information collection, selection, organization and dissemination, so that usability experience designs indirectly helps to promote information activities [11]. The main aim of usability experience design is to help indirectly promotion of information activities. Thus the role of usability experience design in information science includes.

a. The practicing area of information science ranging from information centre, documentation centre, information systems, and information networks may be benefited through the User Experience Design (UED).
b. Through Usability Experience Design user need and expectation can be judged [08, 09].
c. Information Retrieval System of information centre may use this system.
d. As in UED, user experience gets most priority so that proper information designing and information architecture is possible through this.
e. The web portal, interface can be much more easy and effective through this.

V. Cloud Computing and Information Science

We have already discussed that cloud computing is one of the emerging areas of information science for various reasons. Before going to discuss an advanced topic let us discuss the fundamentals of cloud computing. Cloud computing is actually a method or design or mechanism in which virtualization is possible for lot of information technological products like

a. Hardware ;
b. Software;
c. Application;
d. Drivers;
e. Utilities;
f. Databases and so on.

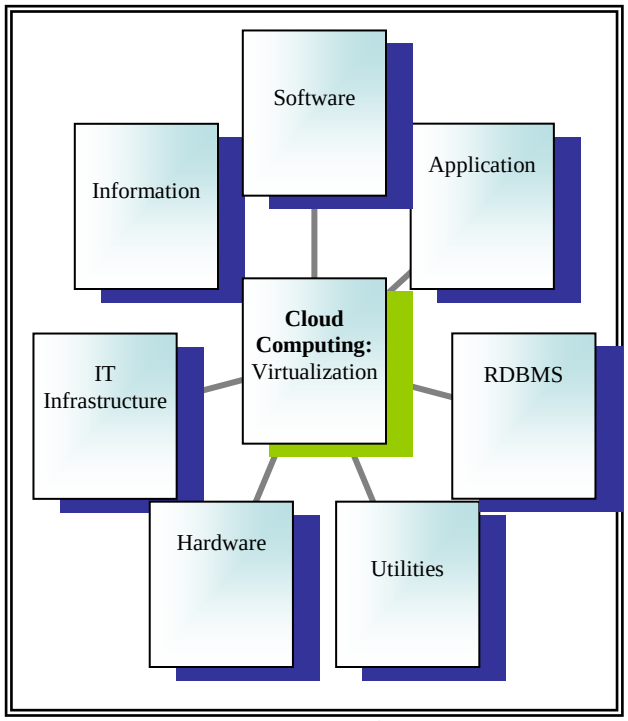

Fig. 3 Weapon and tools of Virtualization

As information science mainly deals with information collection, selection, organization, management and dissemination, cloud computing may be helpful for various purposes like

a. Networked Information Services;
b. Document Delivery System;
c. Indexing Digital Repositories.

More over with the help of cloud computing one big information centre, systems or networks can get information or IT product virtually through the cloud mechanism. Apart from, 'cloud informatics' (application of cloud computing in

the academic and practicing field of information) [14], Cloud computing is essential for following reasons:-

a. Reduction of Information Technological cost.
b. Time and Energy saving of the concerned organization.
c. To create better collaboration among the stake holders.
d. TO create Virtual consortium or strengthening manual consortium for technology and information exchange.
e. Hassle free maintenance of user database, hardware and software.
f. To create better and healthy green computing infrastructure.
g. For better efficiency and activities.

VI. Green Computing and Information Science

Like cloud computing utilization in Information Science, Green Computing is also important for several information science fields. But before going to discuss Green computing utilization in Information Science let us discuss some general matters related to green computing. As green computing means design and development of computing systems and information technological infrastructure which is ecofriendly and less power consuming , so it is useful in many areas of information science[13]. Particularly in the working areas of information science like

a. Information Systems and Networks;
b. Digital Repositories;
c. Virtual Lab and so on.

In the field of Information Systems and Networks green computing inspire about use of less power consuming computing products and services even deployment managed software. Green Computing is also tell us about 'to buy only energy star level products. The Information Retrieval System, Search Engine, Internet café of Information Systems and Networks may get benefit from Green Computing principle [15]. Fundamentally green computing satisfies the following purposes.

a. It directly and indirectly saves energy and money.
b. It helps better algorithm design and recycling of IT products.
c. It supports green and eco friendly atmosphere.
d. It is cost effective and solves the problems of unused computers.
e. Centralization and virtualization give the freedom to the company or industry to connect with other (s) without bearing extra budget.

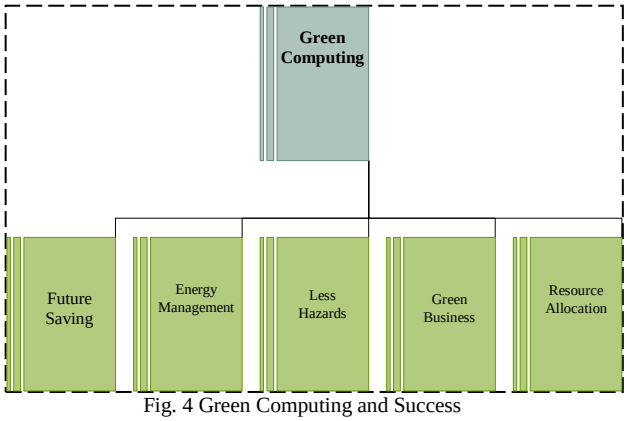

Fig. 4 Green Computing and Success

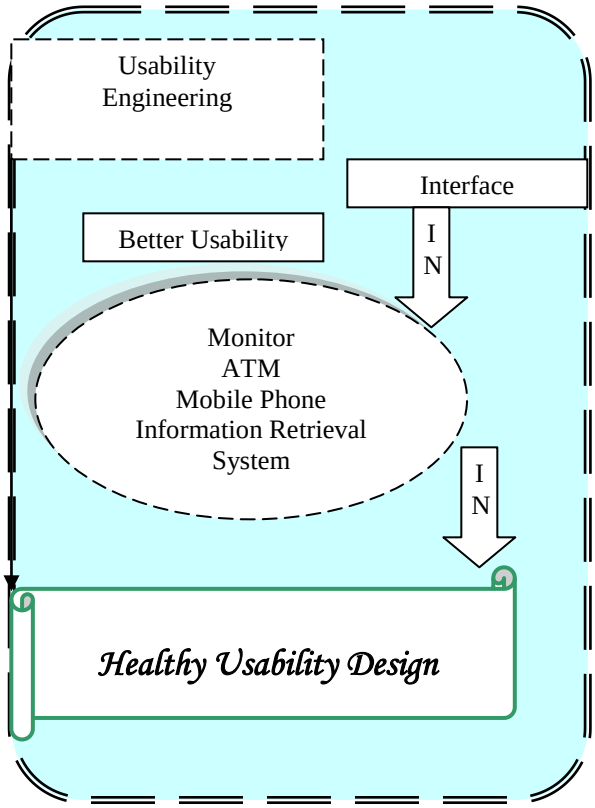

Fig. 5 How Usability Engineering helps in Information Science I.

VII. Contemporary Challenges and Issues

Usability, cloud computing and green computing all these emerging areas have some challenges as well as issues like

a. As far as usability experience design is concerned it has some challenges out of which usability engineering and information architecture are the most vital [16].
b. Still Government and private concerns are not aware of usability design as per user need and demand.

c. Most of the websites of government agencies, universities don't bear feedback facility from the desk of user.
d. Country like India has no policies and standard on Cloud computing and even on green computing.
e. Cloud computing need frequent and high speed broadband. So for developing countries it is the most challenging.
f. Information Systems, Networks and administrators still are not aware of the benefits of cloud based information systems [18].
g. Concerned countries need to depend on third party for cloud computing services.
h. Usability Engineering needs adequate technical and strategical experts.
i. Green computing in many countries is still not recognized as green initiative.
j. Green computing needs awareness among the office staff and administrators.
k. Curriculum and syllabus of computer science and information science in India still not so much associated with cloud computing, green computing and user experience design.

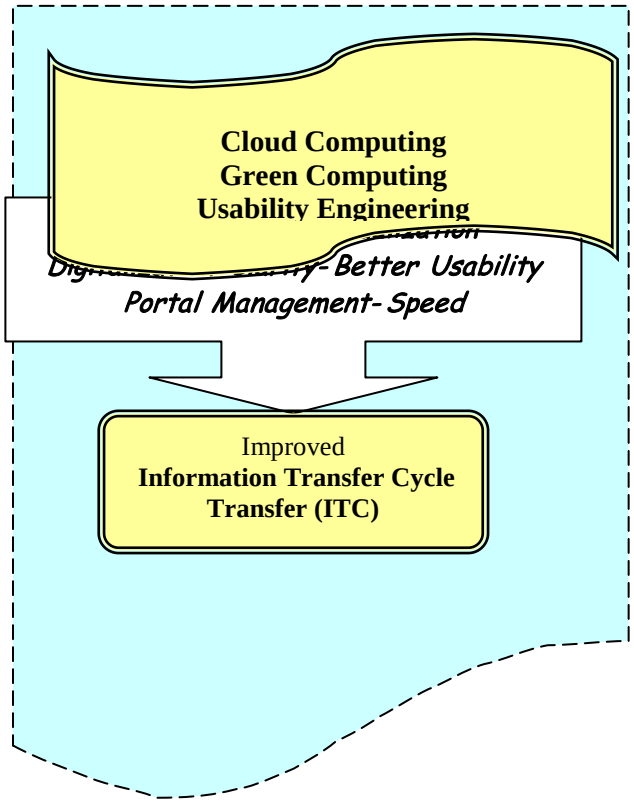

Fig.6 Improved Information & IT Infrastructure

VIII. SUGGESTION

1. Green computing should be taken as the priority area in the field of green movement.
2. Government agencies and departments should use only the machine, computers, tools, which are designed as per green computing model.
3. Government should give fund the departments to buy only energy star label product.
4. Academic and Governmental offices should initiate Cloud Computing systems for their Information Systems.
5. There should be proper budget for R and D in these areas.
6. Website, webportal, interface, ATM interface, mobile interface should be designed based on UED principle.

IX. CONCLUSION

Days have changed; we have entered in to a global village through virtualization and cloud computing. Green computing also promotes eco-friendly atmosphere and energy management in many ways. Though we have several problems in cloud computing, green computing and usability engineering in the developing countries like India, we need to take initiative for faster development of the society [12]. Ultimately these computing technologies and methods will help India to have a knowledge based economy [02, 17].

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