Introduction to Cultural Computing

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Abstract: Computers are one of the most important inventions of human beings. Though computers were invented in the 19th century, it has gone through many changes all through these years. Further Human Computer Interactions are also fast developing in the 20th and 21st centuries. Important among them are Social Computing and Cultural Computing, Internet of Things, Artificial Intelligence and so on. Cultural Computing is mainly viewed as the integration of computing technology with culture. It is a method of cultural translation that was scientific methods to represent the essential aspects of culture. The best common man's example for cultural computing was the 3D laser light projection of the Buddha of the Bamiyan Valley in Afghanistan, in June 2015, which was demolished in March 2001 by the Taliban. In this article an attempt has been made to bring to lime light the concept of Cultural Computing and its approaches and perspectives

Keywords: Human - society - behavior - technology - Human Computer Interaction - personal computing - cooperative computing - social computing - cultural computing.

INTRODUCTION:

Every human society has a system of customs, values and behavioural patterns which depict their way of life. They may have distinction due to many social, economic, geographical and cultural conditions but one thing that binds all societies together is the usage of technology. Particularly, information and communication technology (ICT) and computing technology has provided different cultures a new era of globalization.

From a historical perspective, Human Computer Interaction (HCI) has evolved over more than five decades. Developments in the field of Human Computer Interaction (HCI) have opened up a new direction for the application of computer technology. After the introduction of personal computing, cooperative computing and social computing, a new paradigm for HCI named cultural computing has emerged. The history of HCI goes back to the 60s. More recently, at the turn of the 20th century, HCI was about the social computing paradigm with community mediated interaction. This has opened new opportunities to blend culture with technology, specially computing and communication technology, and therefore reviving cultural values and traditions to overcome the unconscious effects of the Internet and social computing.

The new paradigm for HCI, cultural computing is based on Kansei Mediated Interaction. Kansei Mediation is a form of multimedia communication that carries non-verbal, emotional and Kansei information (e.g., unconscious communication). It is a combination of Kansei Communication (i.e., 'content') and Kansei Media. The following figure (Figure - 1) can explicitly enumerate the Human Computer Interaction and its evolution.

Figure - 1
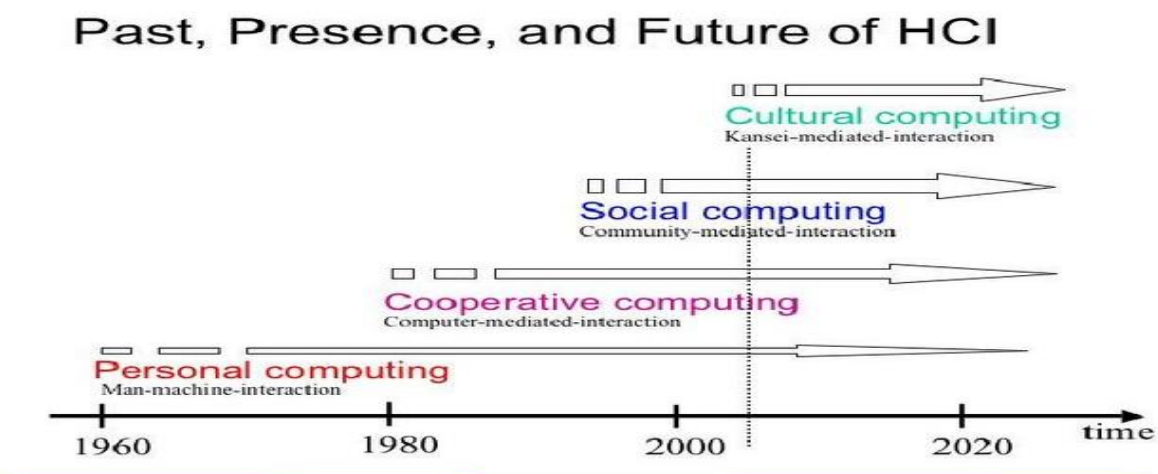
Culture:

The word culture has been derived from the Latin word 'cultus' which means 'care' and the French word 'colere', means 'to till' or 'to cultivate'. It has been defined and used in many ways throughout different contexts. One of the most popular definitions of culture in the field of anthropology is "a complex web of shifting patterns that link people in different locales and that link social formations of different scales". Culture is the integration of human behaviour that includes attitudes, norms, values, beliefs, actions, knowledge, arts, morals, law, customs, language and communications of ethnic groups, religious groups and social groups, etc. The following figure (Figure - 2) elaborates the various aspects of culture and the complex nature of human culture.

Figure - 2
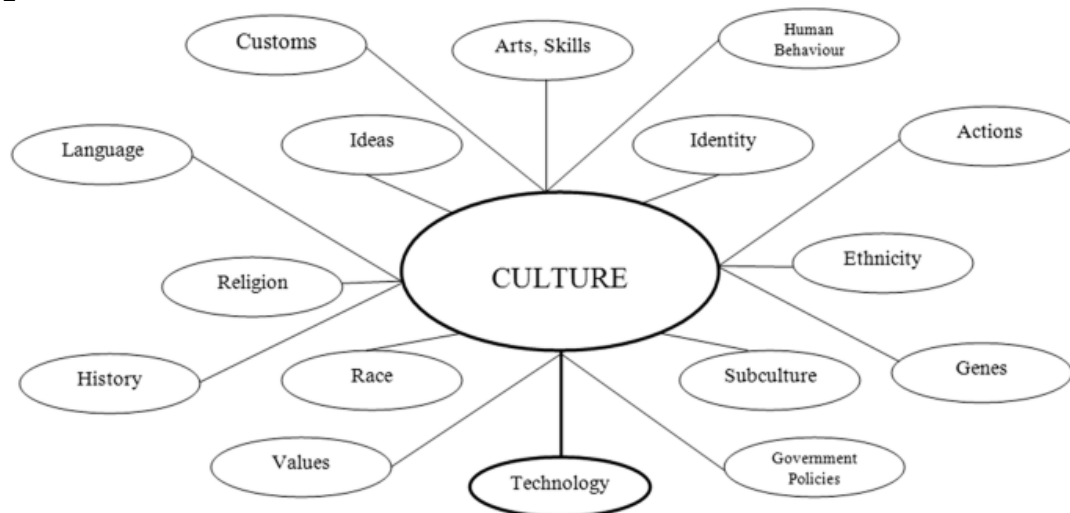
CULTURE AND TECHNOLOGY:

Human and the society and technology are interrelated and they co-constitute each other from the very beginning and they complement each other as well. It is therefore clear that the development of new technological systems leads to the development of human outlook for upcoming eras. So, when there is a progress of technology in society, it leads to the progress of culture. Many economic, social and political aspects are bound to shape, design and implement technology in society. One such factor is societal acceptance.

Hence, culture and technology are related by societal acceptance and time. Any change in technology, in due course of time will reflect change in the culture. For example, changes and advancements in the communication technology in humans from letter writing to the invention of telegraph and now emails; conversations from telephones to smart phones and personal mobile phones etc., have apparently reflected changes in the communication culture of people globally all together. Therefore, the impact of technology on culture is not a new process but an understanding which is required from time to time.

National Assistive Technology Research Institute at the University of Kentucky has described various forms of technology. They are as follows - Information technology, medical technology, assistive technology, instructional technology, productivity technology and teaching technology. Each of these has significant implications in our lives to improve its quality. Out of them, Information and Communication Technology (ICT) is most important. ICT is actually a form of computing technology which carries in itself other attributes like the Internet, World Wide Web, virtualization, interactive experiences, social media etc. Further, in the post Covid-19 pandemic era, the internet usage has been increased tremendously. The number of internet users has been increased from 4,119 million in 2019 to 4,901 million in 2021. That means 59.5% of the world population is using internet in 2021. Further, 92.6% of them are using internet through their mobile phones.

CULTURE AND COMPUTING TECHNOLOGY:

According to Freud theory consciousness is found to have three levels: conscious, preconscious and unconscious. Conscious is the part of awareness mind. A conscious experience is expressible. Preconscious is ordinary or recent memory where things can be brought into conscious from the preconscious level. Unconscious mind is the origin of dreams and thoughts which emerge without any clear cause. It is a store house of forgotten memories that may still be

reachable to consciousness at some later time. Unconscious mind reflects the locus of implied understandings and knowledge especially for the things that one learns so well that we do them without thinking.

In the context of computing technology and culture, computer is a product of conscious mind. However, culture represents socially transmitted behavioural forms, patterns, attitudes, beliefs, etc. All other kinds of human work and thoughts, which are borne by the conscious as well as unconscious mind, also contribute to culture. It is the conscious as well as the unconscious mind that is the source of knowledge and intellectual capital. This knowledge is used for inventing and implementing various forms of technologies including computing technology.

The frequent and regular usage of internet and social computing in our lives has driven us into a new virtual culture where behaviour of the user and the virtual world, are existent and are affecting each other unnoticed. This concept can be explained with the definition of Archetypes. Similar is the case of the use of internet and the related facilities in our daily lives. The recurrence of this practice in due course, establishes in the conscious as well as the unconscious mind of the user that leaves an impression.

CULTURAL COMPUTING:

Over the last 3000 years the peoples of the civilized world created the religious and philosophical traditions that have continued to nourish humanity into the present day. These religious and philosophical contents those are well known, accessible, classical in their culture and relevant from the point of view of cultural computing. Primarily these cultural computing concepts were formulated in Japan and in England to understand the essential aspects of both Japanese and English cultures respectively. The story of 'ZEN Buddhism' attributed to Boddidharma belonged to circa 5th Century BA and 'Alice's Adventures in Wonderland' by Lewis Carroll written in 1865 have been selected as the base for culture computing.

Further, for the Eastern and Western cultures, the main value dealt with is enlightenment, but in different ways. A new direction in the form of 'Kansei Mediation' to enable societies transforming towards enlightenment has been given through modern technology in cultural computing. Simply saying, cultural computing is more than integrating cultural aspects into the interaction. It is about allowing the user to experience an interaction that is closely related to the core aspects of his/her culture. In a way that let him/her engage with an augmented reality using the values and attributes of his/her own culture. As such it is important to understand one's cultural determinants and how to render them during the interaction.

Eastern Culture: (i). ZENetic computer:

ZENetic Computer was and still is considered as an ambitious project that tries to crosses boundaries and complicates simple binary divisions such as those between East and West i.e., modern and pre-modern, science and religion, science and art, etc. ZENetic computer has been proposed to make users to understand the Buddhist principles of recreation of the self. Projection of interactive story telling system represented in ink painting, haiku and kimono has been done. Virtual world is created on the computer by the user with the manipulation of ink paintings. Based on the painting created by the user, an incomplete story having different fragments is generated that infers the consciousness of the user. A subconscious desire for completion of the story by the user is developed. User is stimulated to interact by ambiguous provocations through Haiku, which are Zen dialogues. He interacts through virtual calligraphy. Finally, the system provides union of user's unconscious with unified conscious through some mythological bull that symbolizes hidden self in Zen Buddhism. Technologies used in ZENetic Computer involve three dimensional sansui ink paintings, neural network engine and dynamic chaos engine. ZENetic computer presents cultural computing as "a method for cultural translation that uses scientific methods to represent the essential aspects of culture".

Eastern Culture: (ii). Confucius Computer Project:

Confucius computer is a form of illogical cultural computing based on Eastern paradigm of balance and harmony. Here, researchers have represented Chinese culture based on Confucianism which represents ethical and philosophical system having huge impact for more than two thousand and five hundred years. Due to its extremely complex nature and language barriers, this project is working to enable users to experience Confucianism with the help of computational technology in dynamic and interactive way, hence providing intergenerational cultural communication. The system uses social chat, music and food as main focus. Firstly, Confucius chat bridges communication gap between users by providing virtual chat agent containing user's set of ethical values and philosophies. Secondly, Confucius music offers base for the users to convert any music into conventional Chinese music. Thirdly, Confucius food makes user to learn conventional concept of Chinese food through games.

Western Culture: Alice in Wonderland:

Alice in Wonderland project is an application of virtual and Augment Reality in the field of cultural computing. It is based on the story 'Alice's adventures in Wonderland'. In this project, a mixed reality environment is created that

impacts user emotions and stimulates predefined user behavior. The user goes through six stages of mixed reality environment which makes them experience a series of emotional and behavioral states as Alice went through in the story. Two behavioral drives-boredom and curiosity are focused. In this application, an interactive dialogue is carried out by virtual and robotic agents. It inspires people in Western culture to reflect on themselves in cultural determinants such as logic, rationality, and self. Alice is an educational journey towards the user's heart's desire, designed to provoke self-reflection on a number of other issues: bullying and trusting others; selfish- and selflessness; enjoying the moment or sublimating pleasure.

Alice in Wonderland can be used to give interesting examples of many of the basic concepts of adolescent psychology. Alice's experiences can be seen as symbolic depictions of important aspects of adolescent development, such as initiation, identity formation, and physical, cognitive, moral, and social development.

CONCLUSION:

Culture is constructive for forming social structure, modifying values and choices, improving understanding and abilities for collective action to take place in society. Inclusion of culture in technological field involves exploration, designing, expression, digitization, and interaction etc. of culture with the help of technological methods. Many approaches of digital technology, design processes, interactive media environments can be effectively applied in the virtual world to curb the negative effects of social computing in the current times. Different ideas and approaches in the field of cultural computing have revealed that this field is long-established and includes in itself varied factors of culture from many perspectives.

Particularly, with the advent of internet and other advancements in technological areas, study of computing in various fields of cultural heritage, virtual environments and e-culture has begun to prevail in the areas like anthropology, archaeology, arts, history, music, languages and literature. Also, various implications of cultural computing have aroused according to different approaches used in the field of culture, information and communication technology (ICT), psychology, philosophy and anthropology. This field is very wide in range if we consider cultural aspects in computing technology. However, cultural computing is not only addressing any specific dimension of culture via technology but it is mainly exposure of hidden and forgotten scientific aspects and ancient wisdom behind any culture via latest technologies. Further, it could be presumed that the drawbacks of social computing such as addiction to internet, cyber crime and so on can also be rectified with the cultural computing. Even then, more constructive researches should be done in the field of cultural computing and on the basis of the research findings, this new field of Human Computer Interaction could flourish in the near future.

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