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INFORMATION TECHNOLOGY AND INFORMATION MANAGEMENT IN THE MODERN CULTURE: PROBLEMS AND REMEDIES

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Abstract − *Since multimedia has been penetrating in people's daily life, it is playing more critical and influential role in the modern society. This report aims to providing a brief but thorough picture of multimedia technology, by providing basic background knowledge about multimedia. Along with the development of technology, more and more industries have adopted multimedia technology as an assisting tool, meaning that multimedia has proved its positive impact to the world, as a force of driving advancement. However, it should also be admitted that technology has adverse effect towards the society, which induced a series of ethical even legal issues. In these contentious issues, what perspective do individuals have, and how should they behave if get involved? Especially IT professionals, as experts with technological power, what position do they stand to defend the morality and belief of the society? These questions will be explored in this report.*

*Keywords***-**Information, management, technology, media, culture.

1. INTRODUCTION

"As Director of the Office of Scientific Research and Development, Dr. Vannevar Bush has coordinated activities of some six thousand leading American scientists in the application of science to warfare. In this significant article, he holds up an incentive for scientists when the fighting has ceased. He urges that men of science should then turn to the massive task of making more accessible our bewildering store of knowledge. For years, inventions have extended man's physical powers rather than the powers of his mind. Trip hammers that multiply the fists, microscopes that sharpen the eye and engines of destruction and detection are new results, but not the results, of modern science. Now, says Dr. Bush, instruments are at hand which, if properly developed, will give man access to and command over the inherited knowledge of the ages. The perfection of these pacific instruments should be the first objective of our scientists as they emerge from their war work. Like Emerson's famous address of 1837 on "The American Scholar," this paper by Dr. Bush calls for a new relationship between thinking man and the sum of our knowledge". — Editor, The Atlantic-1945.

Who was Vannevar Bush?; Vannevar Bush [1] an American born scientist and engineer who has headed Office of Scientific Research and development (OSRD) in United States of America during the World War 2. He was first scientist who thought in 1945 that personal computers can be used for practical, creative and applied purposes; his theory had a pre-found influence on personal computer users [2]. Scientists also know Vannevar Bush for his important work on analog computers, laying foundation of a company called

Raytheon, Memex for the hypothetical adjustable microfilm viewer etc. In short, he was chiefly responsible for the movement that led to the creation of the National Science Foundation and his Memex influenced generations of computer scientists, who drew vision and inspiration. As the result, [3] has coined the term multimedia in 1966 that has followed the launch of the first Commodore multimedia computer Amiga in 1985 enabling interactive process between audio, video and computer.

In the modern society, "multimedia" is a commonly used term, which is used in almost every single industry. In the book "Multimedia and Cyber Communication", multimedia may be defined as handling, processing and dissemination of information through multiple ways. Apart from the text, information is also processed and coded to circulate as graphics, images, sounds or videos [4].

With the original term "interactive media', multimedia has its own long history of more than 150 years, but the revolutionary history of multimedia is always associated with the development of computer and digital technology.

2. USE OF INFORMATION TECHNOLOWGY IN THE MODERN CULTURE

Because of its effectiveness and flexibility, multimedia has been widely used for different purposes in various industries.

2.1. **Engineering:** Multimedia is always used to present the motion of movement or tension between forces in engineering industry or studies, such as flash or animation.

2.2. **Journalism**: There has been a trend that e-newsletter has been gradually replacing traditional paper-newsletter, because it contains audio and video, recording of the news in the most presentable manner, so that readers can be kept engaged.

2.3. **Creative industry**: Fashion design industry certainly needs assistance of multimedia to illustrate designs, not only shapes and colors, but also 3D effects or a 360° view for an object, including detailed texture or material.

2.4. **Commerce**: Although advertising industry has been using graphs and videos for decades, modern technology has still dramatically boosted advertising effectiveness. Along with the development of the modern multimedia technology, the contents of advertisement are modified and combined more flexibly and each single object in video or graph can be emphasized with special effects.

2.5. **Entertainment and fine arts**: Instead of traditional cinema, 3D cinema has been popular in recent years, as is known the Avatar is a movie filmed with 1st 3D camera. With special glasses on, audience can have a feel that they are actually in the scene of film, which gives them completely different experience from traditional film screen.

2.6. **Education**: Online-leaning (e-learning) has been adopted by majority of institutions. It characterizes remoteness and flexibility without geographic and time restrictions. It engages variable media types to deliver contents and concepts. Other than computer-based learning, virtual reality is another type of multimedia education, which uses devices such as mask that explores learner's senses during interactivity between learner and device, thus creating an illusion that learner itself is actually in the scene.

3. POSITIVE IMPACT OF MULTIMEDIA TECHNOLOGY AND MANAGEMENT

The multimedia plays significant role in the modern life because of its several advantages as compared to the traditional modality of information dissemination.

The audience accepts information presented through the media much easier and faster, since it stores memory for longer time. In the case of e-learning, multimedia can help recipients, who have less prior knowledge to accept the information. Because multimedia can easily construct information system such as building a cognitive model, connect prior information to new information and highlight important information easily. It is investigated that the information instructed via multimedia takes less time than traditional class style and the knowledge collected from the multimedia is recalled easily. For example, a comparison involving eight studies indicates that tutorial courses based on multimedia on an average save 36 percent in learning time than traditional class. Additionally, students who learn theory of bicycle structure through animation combined with sound and text explanation do better in the test than students, who only learn through traditional text instruction.

Moreover, multimedia technology makes information visual and more impressive. When reading news, the readers usually glance at the huge number of information in a short time, so they prefer more direct modality. Furthermore, multimedia technology combines images, sound and text to create the feeling of third dimension and reality. Compared with traditional text modality, this feature attracts audience at the first sight and enhances impression of the audience after skimming.

Multimedia technology offers more entertainment and interactivity as compared to traditional modality of information dissemination. In the case of e-learning, multimedia-based study system is more easily constructed and organized to create a variety of learning styles, which interact with learners. At the same time, learners could control their own speed of study and dynamically select level that is suitable to them. It means multimedia learning system provides more initiative than traditional class. Moreover, study system combines with animation, music and other media appears to be more attractive and interesting which leads to a better attitude of learners and have a strong positive effect on learning.

4. NEGATIVE IMPACT OF MULTIMEDIA TECHNOLOGY

Modern media technology has led to substantial development of the society; however, it has a number of negative social influences. People's lifestyles, behaviors and cultures are affected by such technology detrimentally. Moreover, impacts of multimedia are even more negative on teenagers and women as compared to others.

Multimedia technology has led to several healthy and social problems among teenagers. Liu [5] has indicated that teenagers who spent more time using or watching multimedia are more vulnerable to the health risks than others. Because indulging in digital media would deprive the time that can be spent on other social and educational activities, such as sports and field trips. Thus, they would have problems of obesity and other health issues in the future. Indulging extended periods in digital media can damage, hearing and eyesight of individuals may be impaired. Some multimedia presents an illusion of life as if it is paradise. Keeping such image in mind, teenagers can be greatly shocked, when they confront to the reality of the society since it may lead to inadaptability in their future. The digital media has led teenagers to social isolation even when they go out from their homes; they still use mobile phones, laptops and headphones. Furthermore, the impact of violent digital media especially video games on children should not be underestimated. Although, there is a direct connection between aggressive behavior and violent computer games, the adverse impacts on them vary according to contents and quantity. It is important to take into account the violent contents computer games, since they influence teenagers' behavior, which becomes more aggressive and make them vulnerable to deal and face situations in the society.

The negative representation is one of the adverse impacts of multimedia. With the expansion of the modern media around the world, multimedia uses women as an object for business purposes. With diversity and spread of multimedia around the world, there is exploitation of women as a commodity for commercial gains. By and large, commercial exploitation of women presents them as bad and cheap objects and such presentation violates their human rights. Various advertisements, videos and music portray women as sexual objects and commodities only. Gettman &

Roberts [6] have pointed out that the way in which women are presented through multimedia, it affects women socially and psychologically. The offensive images present through the modern media may result in psychological and social problems in the future such as increasing violence against women and cases of anxiety and depression. All of these consequences are caused by the over use and misuse of multimedia.

Multimedia technology has led to detrimental impact on traditional cultures. Most of representations of multimedia reflect foreign cultures, ideas, music and products. This affects people especially youth who have grown up with the modern multimedia. Multimedia technology impulses globalization and leads to the loss of traditional culture, behavior, dress and lifestyle [7]. The multimedia presents these foreign products and attractive idea to the people, who belong to different classes of the society; some can buy these global products, whereas others cannot afford them. As the result, it contributes to the division in the society. Because of these negative impacts of multimedia, some countries have placed filter to control and reduce risks of multimedia on their own culture.

5. MOTIVATION IN THE USE OF MULTIMEDIA TECHNOLOGY

The harmful influence of the Internet based multimedia is destructive and enduring. Therefore, how to reduce and avoid the spread of this harmful information as much as possible is an extremely severe and critical question. It is important to investigate motivation of people, who spread harmful information and distort facts using multimedia, since it would help to understand causes of misusing multimedia technology as well as help to find solutions. The purposes of people misusing multimedia technology are generally divided into four categories.

5.1. Financial purpose

Some people misuse multimedia technology to gain financial benefits. For example, by producing and selling pirated copies of movies, music, software and other intellectual property, illegal community can gain huge financial interests.

5.2. To be well known

Some people create fake videos and graphics and spread them through the Internet in order to achieve name and fame. With the help of the internet and visualization of multimedia, fake information is spread at the high rate that leads to serious social impacts.

5.3. Malicious purpose

Some people frame others for the purpose of taking revenge by using multimedia technology or by taking and uploading other people's videos and photos and uploading them on the internet.

Tyler Clementi, a student of the Rutgers University and a gay teen ended his life in September 2010, soon after his sexual encounter with another man [8]. His roommate uploaded his act on electronic media, relentlessly taunted him, and violated his personal right by misusing media. This event showed that the misuse of multimedia technology can cause serious consequences, indicating that such malicious motivation could prove very harmful for individuals, people and the society.

5.4. Unintentional purpose

Some people modify and upload pictures and videos of other people for entertainment without their permission. Once these pictures and videos are uploaded on the internet, they become popular affecting the lives of people economically and socially.

The 19 years old boy named Zhijun Qian was a common Chinese teenager. In 2003, a netizen took his photo and uploaded on the internet, which quickly became a spoofing craze. The boy's picture was modified and morphed by thousands of netizens for their own treasons, which has resulted in the appearance of pictures on numerous BBS. This condition seriously affected boy's normal life. He said he was afraid to open the website and even worried that some people may modify it for some pornography visual with his face. His phone was always busy even at night because enthusiastic people were kept calling him for fun.

6. ETHICAL ISSUES

Multimedia technology brings fundamental changes to all kinds of visual contents. Increasing amount of visual contents become available in digital form, from still image to video and film. More importantly, the nature and facture of these visual contents changes greatly. In the past, a photograph was believed as a neutral reflection of the truth or an accurate record of an event. Because it was made by machine, therefore it was neutral and free of human intervention and personal biases [9]. However, with the digital technology, a photograph can be easily adjusted and altered. People can add or remove a part of content in a photograph, use different parts from different photographs to compose a new one undetectably, or even start from scratch to generate a new image which looks like a real photograph.

Technologies include digital visual effects and computer-generated images have found significant commercial value in advertising and film industry. More and more advertisements use digital technology to create fanciful images and videos to attract audience. There is hardly any single Hollywood film goes without digital visual effects. It is cheaper and safer to make up dangerous action scenarios through computer-generated images than using real shots. Some of the filmmakers even made a whole film by using computer-generated images.

Multimedia technology has made it easy and quick to make up realistic images and videos, while the same technology can also be used to make up faked contents. The abuse of manipulated photographs in newspaper, internet and online shopping website exhibitions has already made negative impacts on the society.

Ethical issues were arisen ever since digital technology was introduced to journalism [10]. Photographers and newspaper editors can change contents of a photograph or make up a scene that they did not capture with their cameras. Especially, when an event of great public interest has no available photograph, the newspaper editors sometimes seek to make up similar photographs to catch the attention of the

public. These manipulations are usually and virtually undetectable and the manipulated photographs are included in news sections without any special announcement [9]. The readers are accustomed to believe what they have seen in the photograph as the proof of the accuracy of the story. Accuracy, honesty and reliability are ethical principles of journalism, therefore manipulating news photos compromises trust of the public and credibility of journalism. It also leads to negative   impacts on public because the fake messages delivered from   the news confuse people. Therefore, it is considered as an unethical use of multimedia technology.

Faked images and videos gain a broader impact on the internet. With the internet, anyone who has multimedia knowledge can easily make up stories and spread them widely within a very short time. An extreme example happened in 2007 in China. Zhenglong Zhou, a hunter, asserted that he had found south china tigers in a forest in Shanxi province in October 2007. He showed a photograph of a south china tiger sitting in brushwood as evidence. His announcement attracted attention of the public immediately, since this species of the tiger was extinct in south china decades ago. This species of the tiger can be seen only in captivity inside the zoo. This news and the photo that Zhou has provided spread on the internet all over China within a day. The government was happy to find this rare animal in wild, they awarded Zhou 20,000 yuan and planed to set up a natural reserve for this species of the tiger in the area of that forest. However, soon many concerns and eyebrows were raised soon after that, questioning the legitimacy of the discovery and the reliability of the photograph. The debate lasted for two months until the original and real poster was found which showed the south china tiger sitting on the grass in front of a waterfall. The image of this tiger was the same as the image in Zhou's tiger photo. The original poster was produced by a company several years ago. The truth evoked great indignation of the public, legal suit was filed again Zhou, who was finally convicted and sentenced to two and a half years' imprisonment. In this case, Zhou attempted to deceive the public to gain personal reputation by uploading fake content and making fake story through digital media technology. However, an IT professional or an IT skilled person is fully responsible for what he does if he misuses his technical expertise in dealing with those less knowledgeable. This extreme example shows that the misuse of multimedia technology and internet can lead to unpredictable social impacts and serious legal consequence.

Another example of misuse of digital technology is the manipulation of product photos in some online shopping website. Most of the online shopping websites provide photographs of selling products, especially clothes, shoes and ornaments. It is the only way for customers to judge these products by their photographs. With photographs, customers can see the color, texture and style of the product, and decide to buy it. By changing color or embellishing texture of products in photographs, online shopkeepers can make these products look more attractive and it is easier to tempt customers to buy them. When customers receive their goods, they find the goods are not the one they have seen online and ordered. Such manipulation deceives customers by delivering feigned information of products; therefore, it harms interests of customers. It can never be ethically acceptable.

7. LEGAL ISSUE

There is hardly any legislation available that directly applies to the misuse of multimedia, It may cause legal issues in certain industries, one of the most typical areas is marketing and advertisement [11,12].

As stated before, multimedia is used more and more in commercial environment as an innovative and creative technique. Multimedia advertisement can better illustrate and visualize concepts to audience, by using variable media types and special techniques, which include Photoshop and animation tools. With the help of these technologies, the contents in advertisement can be manipulated freely to distort facts and figures in order to make it more vivid and better to attract attention of the audience. However, the question is how much manipulation is reasonable? When advertisement is exaggerated or over-manipulated, it might be "misleading" or "deceptive" to audience. Enterprising small businesses should prosper on the merit of their products or services without fearing that competitors will gain an unfair competitive advantage from dishonest representations [13]. Through exaggerated advertisements, the expected effectiveness of products is enlarged from consumers' point of view. Ultimately, if consumers intend to believe in the effectiveness, the dishonest businesses will gain more sales revenue than the honest ones.

Present day advertisements on "less wrinkle in one minute" or "wrinkleless skin" are exaggerated and deceptive, since it is highly impossible to restore such an aged face to perfect youth. Whether it is misleading or deceptive, such advertisements must always be is examined with particular reference to the customers [14]. Businesses may include exemption clauses or disclaimer along with advertisement to protect companies from any disputes, claims or liability likely resulting due to such advertisements. The Australian Competition and Consumer Commission [13] has stated that exemption clauses, disclaimers and other exclusionary devices will rarely be effective to prevent exaggeration and deception in advertising industry [15].

Regarding improper and unfair sales techniques, some of legislative regulations on advertisement are

- *Fair Trading Act*
- *Trade Practice Act (1974)*
- *Guidelines on Advertising and Selling (4th Edition, December 2004)*

Other than marketing industry, multimedia may also get involved in the academic world i.e., violation in the Copy Right acts. The current Copyright Act 1968 does not classify multimedia as an individual category of work for the purposes of copyright protection. As a result, it is important to protect a multimedia product that you have developed by having an agreement, which includes a clear definition of who will own the intellectual property asset. In order to maintain copyright ownership in multimedia product, it is prudent to mark the product with a copyright symbol e.g., ©20XY (year of publication), "ABC Pty Ltd" (name of copyright owner), and "All Rights Reserved" [11].

8. VIRTUAL MORALITY AND MODERN CULTURE

The virtual world is completely different from the real world, without rules or boundaries to restrict people's behavior. Apparently, it is true that any one's behaviour cannot be always under surveillance. The best example is that when personal privacy is violated by misusing digital media and private information including photos and videos are up loaded and shared on the Internet without owner's permission of the owner, this does not mean that the person publishing or uploading them will be punished.

Two common situations that multimedia ethics may come across are

- *Deceit, dishonest and falsification*
- *Copyright of intellectual property*

In the first situation, it is more likely the Information and Technology professionals may be involved in ethical issues, while in the second situation, general public may participate. For the information and technology professionals, they are "knowledgeable people" as predicting that these advances "will quickly increase the internet's output (of data) by a factor of a thousand or more." Desbarats [16] simply means that they are playing an influential role in internet environment. They are trained professionals, expected to deliver updated information and advanced technologies to the society rather than manipulating multimedia to deceive or mislead the public [17].

Sometimes, falsification is conducted with the sole purpose of defamation, and widespread of slanders and scandals while in some serious cases, slander could be a civil injury and incur a court case. However, deceit, dishonest and falsification may not lead to a civil wrong and court case, but it may have an ethical extent and pass wrong information and impact adversely to the public. For instance, e-journalism is a type of multimedia-assisted social media, containing massive information about recent news in the society, with essential characteristics of truth [16]. Any dishonest person may negatively impact the moral and social value of individuals, and possibly influence common and best practices.

It is always difficult to keep ethics in mind, even for IT professionals. Here comes the question: which one do you prioritize, ethics or personal interest? Brey [18] has stated in his article "Is Information Ethics Culture-Relative"? Yes, it is as suggested by [18] that "in conception of virtue-centered moralities, individuals have duties and responsibilities that stem from the central value of a common good. The common good is conceived in terms of an ideal conception of community life, which is based on a well-balanced social order in which every member of the community has different duties and different virtues to promote the common good". Therefore, information and technology professionals should develop the sense of prioritizing public interest before personal benefit; they ought to use their skills and knowledge to "promote the common good".

Instead of solely relying on information and technology, the professionals and individuals should take responsibilities to develop the sense of self-protection, which includes protection of personal privacy and also the ownership of their original work to further enhance ethical issues in the modern society. Further more, people should have the ability to distinguish true and false in any publication, to avoid being misled.

9. DISCUSSION

This report has presented the application of multimedia technology in modern society and its two-edged impacts on the modern culture. After that, the report has explored the motivation of misusing multimedia technology and highlighted ethical and legal issues of misusing information technology and multimedia. This study discusses the virtual morality which must be practiced by information and technology professionals as well those in other professions.

Various factors motivate information and technology professionals as promoters in the industry [19]. On one hand, some promoters of advertisements and shopping websites are information and technology professionals using multimedia technology for unfair competitive advantages and financial gain, whereas some other information and technology professionals and other skilled people use technology to get personal reputation or seek popularity. There are also p who use technology to harm others or simply just for the fun. On the other hand, many information and technology professionals and promoters in the industry make their great efforts to develop better technologies and use them to offer other people higher efficiency and more convenience.

Information technologies have already brought significant progress to the modern society, from education to entertainment and from commerce to engineering. People now enjoy much more convenient life than ever because of wider use of information technologies. However, technology will never be easy to use since every technology is a two-edged sword. The more power people can gain from one technology, the more destruction it can bring. Only if our intelligence can lead us to the ethical direction while using information technology only then this technology would make better human society.

Like many other modern technologies, the information technology will have negative impacts on the society if misused by the people for unethical purposes as discussed above. However, information technology represents great advancement of human society despite of its negative impacts. First, information technology enables people to generate new information and content easily and solve larger problems faster than they can be resolved manually. Various industries such as engineering and commerce have gained significant technical and financial benefits from these technologies. Moreover, the information technology enables people to copy and transfer information and knowledge much faster and freely. With the information technologies, people can learn more and learn easier. Therefore, such technologies will impulse the development of human society in the long run [20]. Furthermore, the information technologies greatly lower the economic boundary of getting knowledge. Even the lower class people can get access to information and knowledge through the internet at a reasonable cost. Thus, these technologies actually ease social differentiation if they are used in a right direction.

In summary, technology is developing, and due to its two-edged impacts, it will always challenge individuals' morality against personal gains. How to behave when technology becomes a tool for personal gain? Perhaps this will always be

a question for information and technology professionals.

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