

Diffusion Innovation in Movies Development: Computer Generated Imagery

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Abstract— This paper provides with a brief review and literature progress on the theory of diffusion of innovations which was made popular by communication scholar Everett Rogers (1931). The diffusion process is concerned with how innovations spread, that is, why they are assimilated with in the market. I have chosen the CGI (Computer Generated Imagery) effect for movies industry development, because in the field of international movies. CGI have been redefined into something the something ‘new’ in the local market of movies. The aim of this paper is to explain how this innovation of CGI were applied in the field of movies and to offer theoretical explanations for the pattern of diffusion of CGI.

Keywords— diffusion of innovations; development of the movies; CGI (Computer Generated Imagery) adoption on movies

I. INTRODUCTION

Globalization was created to illustrate the scope of world development which is happened in communication and culture [1]. But now, people live, basically, depending on technology replaced social and cultural local system which outdated. The roots of globalization is “The Electronic Revolution” and secession communist countries. This revolution has multiplied the effectiveness and speed of communication, transportation, production, and the edict. Wu and Chan believed that the mainstream in globalization is from the developed countries which directed onto the developing countries both flow edict, technology, and culture [2].

The influence of globalization also highly perceived in the media and its products. Globalization is not only affecting the industry, market, technology, but also the media content. However, this study was conducted to look more deeply about how CGI has been used for innovation in the development of film. This study was also conducted to know the development of CGI in developing countries, particularly in Indonesia, and examines various challenging which is need to be reviewed it process and success in supporting the uptake new technologies as the renewal for film.

II. CGI (COMPUTER GENERATED IMAGERY)

Innovation on ICT (Information and Communication Technologies) is not only an important development in globalization, but also the competitiveness of European

countries in reviewing the research about ICT, because it was believed that would affecting economic prosperity based on state of knowledge. The development of ICT in the media industry has challenged improvement for its, especially in this study we wanted to see the development of ICT on film industrial development, with the use of CGI in film and how the fabrication was absorbed as a renewal on its.

CGI (Computer-Generated Imagery) is the use of computer graphics (3D computer graphics) in the special effects. CGI was used on film, television programs and advertising, and also print media as replacement of the actors in the crowd (stunt virtual). Computer software such as 3D Max, and the open source Blender, Light Wave 3D, Maya and Softimage Auto Desk are used to create computer-generated images more quality for the fabrication of film.

CGI was also used in the fabrication of film, ‘cause it makes costs cheaper than using the physic methods (the performer), such as creating a quaint miniature with effects shots on a lot of extra skins in the crowd, and therefore, it allows the creation of images more quality are not feasible using other methods besides CGI. So, the use of CGI on this fabrication is something innovation for the film maker in the present.

Diffusion Theory was always connected to the diffusion of innovation examines the uptake of renewal is more to development. This innovation means an idea, concept, or something considering new by itself and society through the process of uptake which could be predicted [3]. Most people will adopt any innovations as soon as they heard these innovations. But there are also other community

groups that require a long time to adopt something innovations. So if this innovation widely adopted by many people, the uptake of innovations will “exploded”, that’s what we called.

A. CGI Development in The West Countries

It is important to study the history of CGI as an overall assessment in the study of visual media to develop CGI as the benefit. 2D CGI was used, firstly, on movies in 1973 by the West. The early use of CGI is known as a 3D image contained in the sequel film, “Futureworld” (1976) [4]. The features that successfully made were computer-generated faces and hands which is made by scholars whose graduate of the University of Utah Edwin Catmull and Fred Parke. As a form of trial and investment CGI, “Tron” (1982) and “The Last Starfighter” (1984) used CGI, but failed in the process of uptake. Onwards, the utilization of CGI Photorealistic also unsuccessfully in the film industry until 1989, although “The Abyss” which represented the utilization of CGI but won the Academy Award for Visual Effects.

2D CGI increasingly appeared in the “traditional” animation film in 1995, when the first fully computer-generated feature in the film-production of Pixar’s film, “Toy Story”. Digital additional CGI in animation studio which is produced by Blue Sky Studios (Fox) and Pacific Data Images (Dreamworks SKG) is an organization that began making the transition from traditional animated films which have used CGI.

In 2000, computer-generated images which is produced, become dominant in forming the special effects in the fabrication of film. CGI usually give about 1.4-6 megapixels for films, such as in “Toy Story” [4]. The development of CGI technology always reports to SIGGRAPH (Special Interest Group on Graphics and Interactive Techniques), which is an association for students of computer graphics and interactive techniques, for each years. SIGGRAPH is attended by tens of thousands of experts and professionals in the field of computer communication technology per annum. Developers of 3D computer games and animated video seeks to achieve the same visual qualities in the personal computer in real-time to the utilization of CGI and animation films. CGI onward progress rapidly to contribute the quality of fabrication, and then, making the film-maker has started to use a bit of game machines to make non-interactive films are known as Machinima. Many successful-organizations has used CGI in their films, such as Pixar, Dreamworks Animation and Blue Sky Studios, also Disney WDF, which has been converted into a CGI studio, and Orlando studio in Paris.

B. CGI in Diffusion of Innovations Process

In the opinion of Everett M. Rogers (1981), diffusion is a process by which innovation was delivered through various channels for a certain time to the social community [5]. Rogers has looked the diffusion of innovation as a social process that communicates the announcement about the new ideas which are viewed subjectively. Diffusion of innovations theory basically describes the process of how an innovation has been communicated in the process of communication through certain channels over the time to members of the social system and made its existences into

permanently. Model and the diffusion of innovation theory is a theory that requires a source of stem receiver. If a source of stem receiver encourage recipients to accept, then it have achieved. The diffusion of innovation research has been much associated with various phenomenon which expands in the community. Various perspectives also became the basis of the assessment process of diffusion of innovation, such as economic perspective and the perspective of ‘market and infrastructure’.

The utilization of diffusion of innovation theory in my view, most studies of technological innovation, it is necessary the needs or the needs of renewal. In the film industry, diffusion of innovation was used to look how far the process of technology dissemination reach to the public which relish the results of CGI in films. This absorption of renewal was more impact to the development of media industry more specifically spread innovation to the film-makers in developing countries.

In the industry films, CGI was a new innovation for made films. It is also made to develop in the making of film that had quality and efficiency. It becomes important to meet the needs of film-makers. An important goal with the existence of this innovation is for the creator, film director and the availability of advanced technology for manufacturing the film, so that changes to improve the quality of films to be better.

Innovation is an idea, work or object which is perceived and felt by members of a social system by determining the level of adoption against the renewal or reform, include: relative advantage, compatibility, complexity, trialability, and observability.

Relative advantage is the standard where innovation was felt better than other ideas. The utilization of CGI in film-making will make the effect in films which is shown more quality and efficiency without reducing the creativity of film-makers. Compatibility is a measure of where innovation be felt in line with prevailing values. The use of CGI as the development of innovation in film-industry has been widely used in the fabrication of Western films that in line with the development of global media. Complexity is a measure of where innovation is too difficult to be understood and used. The use of CGI has been implemented in each fabrication of films, especially in Western countries and developed countries. Trialability is standard where innovation is applied on a limited basis. The use of CGI is still perceived as a new innovation for the film maker in developing countries because its difficulties in implementing and also matter expertise. Observability is a measure of where other people can observe the innovation.

The utilization of CGI has been much seen on the form of film-impressions in Western countries so that audiences can feel the presence of film quality on the use of CGI in the show. Reviewing any communication technologies film can also use this theory, because through the ideas which is contained in the storyline of each film, it can also raises inspiration, till in the development of communication technology in the fabrication of films. Due to the influence of globalization, developed countries also have shared their technological advances in the media industry, especially in studies films, to developing countries through the sophistication of communication technology. Through the

latest media technology namely CGI, film-industry will become more quality and efficient to reduce the cost of the film-making, without limit the creation of ideas, creativity and also reduce marketing in the film industrial economy.

III. LITERATURE REVIEW

In this study we wanted to examine more deeply about the application of the theory of these diffusion innovations into film studies, where there has been some reviewers who evaluated the diffusion innovations on the process of making a products for future development. From some of these studies, it would appeared that globalization brought its influence to any films in every countries. However, based on existing studies, the apparent trend is the Western countries disseminate the culture and ideology to developing countries through the effects of technological sophistication from the film. This is in accordance with more advanced mass-media technology and more open the demarcation between the countries due to globalization.

“The technologies that make the global culture is possible also facilitate the dissemination and hence revival of distinctive local cultures” Knight (2000, p. 242) [6].

One thing that we could not deny is the role of communications technology in globalization have diversity efforts in connecting the increasingly sophisticated communications systems into the whole world. Its also applied through the film as an intermediary for the media as product global-medias. The impression of globalization has made the spread of technology in the national film industry. The technology is intended that wasn't only about cultural which is conveyed through the films, but also which is connected to techniques in fabrication and direction.

Techniques of 'Computer Generated Imagery' (CGI) which was as a 'trend' in Hollywood films have applied into films in Malaysia. Malaysia's viewers has 'demand' the technology used in film and CGI techniques that have become one of the intended medium. Evidence that stand (salient) could be seen in the film that has erupted in the late of 2006 namely “Cicakman” [7]. Cicakman, although not the first film which use CGI techniques, but has become an inspirations and references for the class of film maker to initiate some ideas which is not linear for realize the science-fiction films.

The perception about using CGI which is still considered too expensive, made the uptake process isn't progressing. There are many factors that cause majority of production houses considered the making of animated films spending high budget. Moreover, another factors that contributed towards this misconception is the lack of reference to make price comparisons. Actually, the cost of income 'Computer Generated Images' (CGI) and animations is not too expensive.

This case is recognized by the director of animated films 'Libas', Amr Osman Najmi, whose also the owner of Two Tones Sdn. Bhd to Utusan Malaysia Daily, which argues, the lack of reference caused the production houses is difficult to find benchmark quality CGI or animation in the film and drama [8]. Numbers of companies that offers submission of making animation and CGI too little caused there is no competition at competitive prices. To overcome the inverse opinion that CGI and animation was expensive, Amr advised

the publishers to understand the process of income in generally to be not deceived and charged unreasonable, so there is development in the Multimedia.

The film industry through these CGI innovation will prove its ability to help to develop new forms of economy and the potential to be a source of income as well as choice of career among the young generations, like anime industry within Japan and other developed countries.

Others innovation diffusion studies which support this study to make the paper work including the diffusion of innovation in the review articles are reviewed by Kaarina Hyvonen, titled “Diffusion of Mobile Services in Finland”. This article examined the uptake of mobile services technology based on: the type of mobile services that are used and the purpose of using it, who used it; what are the advantages and challenging from the utilizations of mobile services; furthermore how this study can be connected to diffusion theory; also looked at demographic factors and problems issues in using mobile services [9]. Approach to innovation diffusion theory in this article more emphasis on the adoption of mobile services technology to individuals whose interesting about sophistication from the telephone to support for the use of mobile services. Process of diffusion in the use of mobile services access gives explaining against the adoption process as a function of the mass because technological innovations that are disseminated to a large scale. This article give the emphasizes of acceptance from technological innovation that shows the need and convenience for its users. Distinction level of its class make differing levels of acceptance also in Finland.

Research in this article was using survey theorem via the web on 779 respondents, and responded by 582 respondents. Attainment of research in Finland states that type of mobile services which is more used by people is SMS (Short Messaging System) to communicate is demonstrated by, when the use of MMS and mobile email only 4.5%. Viewed based on demographic factors, younger age groups tend to use more types of mobile services compared to older age groups, which would most likely use of mobile services mostly depend on the sophistication of telephone. So, if viewed based on gender, men prefer to use email and news, while women prefer to use logos and ringtones. Then, if viewed from the clinical benefits and challenge the use of mobile services is the ease of access and its challenge which is the feature-feature that needs to be studied again using it, when problems in its use, the main problem is the expensive cost of the service. So, which is found from the results of this article that the users of mobile services in Finland is not passive, they received this innovation in accordance with their need in the future.

The results of this study shows the process of adoption of innovations in the majority of the respondents and the development of mobile services which is expected to line with the development of cellular. Using diffusion of innovation theory, in this study can be seen a change in behavior, attitudes, and knowledge of respondents to the mobile services according to their needs. From this study, contributions made by using innovation diffusion theory in this article has seen the major factors that influence the process to the social demographic factors, which actually is not a major factor for predicting the adoption of mobile

technology services in the process of innovation diffusion. Behavior of the new technology is actually a major factor in predicting the diffusion process in this study.

We review in this article, there was indeed some of the neglect of social characteristics such as demographic, education, and income. Diffusion of innovation theory has influenced people in the receiving of something renewal. But more accurately if the reviewer uses the theory of utilization and satisfaction, which is an active community in this communication process, so people choose the media based on the results of the use of mobile services based on the review, the way audiences use, which all of its will determine the impression / impact on the users, so users become selective for complacency.

Beyond the study of diffusion processes in the health, which in the article Mike Clark and Nick Goodwin on Sustaining Innovation in Telehealth and Telecare under the sponsorship WSD (Whole System Demonstrator) Action Network, in 2010. This article specifically examines the development progress in the health that simplify and reduce hospital admission as a home care for patients [10]. In this study also examined that Clark and Goodwin has found 1.6 million and 1.7 million patients in Britain have been using this Telecare. Among European countries, Britain is pioneering the use of Telecare benefits than it had reached about 5,000 users, but telehealth services is still relatively undeveloped. Spreading innovation in its development, there are gaps in challenge and absorption and adoption. Challenge faced a problem for the use of innovation in this field is the lack of health evidence efficient use of the cost for this innovative experiment. For the professional workers in adjusting and adapting these innovations to the lack of market demand, lack of possibility of the enactment of minimum standards for the use of this technology.

Adoption and diffusion of telehealth is applicable to all health organizations factors, including the involvement of each officers, providers and users are proactive. Telecare and telehealth innovation is a new strategic tool for the advancement of the health. This diffusion of Telecare and telehealth innovations has been proved by showing that this services has a potential to support a number of patients which is their treatments can be done with a remote observation, this will cause the maintainability of the patients become more efficient in the use of his rented and the period required for treatment to hospital would be more effective. So the health become more effective and the cost will become more economical, this is provable in the achievement of innovation acceptance telehealth and Telecare in England that so many reviewers and users who use this telehealth and Telecare. However, for achievement in the process of conservation of this innovation is not easy. Kingdom of Great Britain reported that, there are significant barriers to adoption and diffusion of innovations of this new respecting technology (Liddell, et.al.208) [10], this is caused services innovation is allowed to spend a longer period, compared to the diffusion of innovation into the product.

We review that telehealth and Telecare in the public health that have been developed to limit the payment in the public health, may be more developed in the progress of the diffusion. The use of diffusion theory is also accordance with the health development studies. And this study uses the

theory of diffusion in line with this study. Because there are dissemination of innovation services process is also done in the housing and another social care activities, to make individuals and families of patients in order to remain able to care at home for as long as they need each and become independent of health each individual.

Lu Wei and Zhang Mingxin, review of The Adoption and Use of Mobile Phone in Rural China: A Case Study of Hubei, China in the journal Telematics and Informatics. In their study about psychology and behavioral factors that affect mobile phone reception in rural areas in China [11]. Innovation diffusion theory are also often influenced by psychological factors that have a smaller role compared with factors of behavior. Behavioral factors also can foresee some of the psychological factors that influence the acceptance of mobile phones. This study used survey theorem and the results obtained from this study, in terms of acceptance in society is the demographic factors age, male, less educated, have a low interaction within the family, have a positive perception, and have a top lifestyle needs to be easier in the receiving mobile phone. Onwards, in terms of its use assessed through telephone number of callers per day, known that interpersonal communication and socialization plays an important role in the use of mobile phones.

The use of this diffusion of innovation theory is supported by two factors. There are psychological factors and behavioral factors. In the study assumed that acceptance and use of mobile phones by rural communities in China is influenced by demographic factors, psychology, and behavior. Three factors that influence the behavior of public perception regarding mobile phones is the use of mass media, interpersonal communication, and acceptance of other communication technologies. PCM is the psychological factor (Perceive Characteristics of Mobile Phone), PNM (Perceive Needs of Mobile Phone), and PPM (Perceive Popularity of Mobile Phone). Demographic factor is age, gender, education, income, marital status, and innovative. In addition to using innovation diffusion theory, researchers are also using the uses and gratifications theory to examine the needs of the community to mobile phones in line with case applied.

We review that the use of innovation diffusion theory in this study are in accordance applied cause researchers wanted to examine the acceptance and use of mobile phones by the public. When the uses and gratifications theory is used to reinforce the use of theory to study the use of mobile phones. The weaknesses of use of innovation diffusion theory in this study is the researchers did not discuss anything simple about the stages of acceptance and use of mobile phones, as a measure of acceptance of an innovation. By knowing the stages of acceptance of an innovation can be inferred the extent of acceptance and use of mobile phones by rural communities in China, the higher stages of absorption is achieved, the higher the level of public acceptance of an innovation.

IV. CONCLUSIONS

Based on what we want to examine about the diffusion process of innovation. In the development of film-making by the use of CGI has also been supported by several studies that have been we review in this worksheets. We saw some

reviews articles as a contributor and giving edict about the phases in the process of diffusion of innovation. The implications of innovation in the media that see innovation can be something that brings good and evil, which will affect the culture, audience behavior and personality. Progress is supported by the presence of media and technological advances now also as a share rather than the result of absorption into the renewal of community development in the presence of mind.

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