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Further the Future: The Exploratory Study in 3D Animation Marketing Trend and Industry in Thailand

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***Abstract*—**Lately, many media organizations in Thailand have started to produce 3D animation, so the quality of personnel should be identified. As an instructor in the school of Animation and Multimedia, the researchers have to prepare the students, suitable for the need of industry. The current study used exploratory research design to establish the knowledge of about this issue, including the required qualification of employees and the potential of animation industry in Thailand. The interview sessions involved three key informants from three well-known organizations. The interview data was used to design a questionnaire for the confirmation phase. The overall results showed that the industry needed an individual with 3D animation skill, computer graphic skills, good communication skills, a high responsibility, and an ability to finish the project on time. Moreover, it is also found that there were currently various kinds of media where 3D animation has been involved, such as films, TV variety, TV advertising, online advertising, and application on mobile device.

***Keywords*—**Animation, marketing trend, animation industry, Thailand animation.

I. Introduction

ANIMATION is the process of making the motion image by changing the sequence of static images rapidly. The outcome of this process is a motion picture, which is generally called, "phi phenomenon." Normally, the speed of changing image is 9-16 frames per second. Laowansiri [1] summarized the principles and qualification of animation, which are (1) to create an unlimited imagination, (2) to explain the complex things clearer and easier, (3) to illustrate the idea concretely, and (4) to emphasize or clarify the important point obviously. The type of animated movies can be categorized into three types based on the production technology [2] as following:

1) The Traditional Animation is an animation technique where each frame is drawn on paper or cel (transparent paper-like cellulose). Other techniques are stop motion and cut-out animation.
2) Computer Graphic animation is the animation created by computer graphic in the whole process, such as using Adobe Flash or Adobe Edge Animate for 2D animation, and using 3Ds Max for 3D animation.
3) Contemporary Animation Movie is the mixed technique between computer technology, traditional drawing and painting.

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Currently, the programs used to 3D animation are user friendly. In Thailand, there are many animation production companies. Based on the data of Software Industry Promotion Agency (SIPA) [8], it is claimed that the value of Thai animation industry in 2014 was 3,503 million baht, and the growth of exported animation was 20.7%. Moreover, there were more than 100 animation companies registered at SIPA. This showed that animation industry in Thailand has been growing rapidly.

The current study focused mainly in the 3D animation production. The production was divided into 2 categories which are also the types of 3D animation production companies:

1) Animation production company produces the narrative animation that use the main character for storytelling. This kind of production includes TV cartoons, animated movies, and short animations in the advertisement. The character design copyright is owned by the company.
2) Computer Graphic (CG) company produces the visual effect in the post production process, advertisement, video presentation, and 3D animation.

There was little known about the practical process of 3D animation production. The current marketing opportunity, trend of development, potential of 3D animation production, and guideline of human resource management of animation industry will be explored in the current study.

II. Objectives

1) To study the practical process of 3D animation production in Thailand, 3D animation software and the latency of 3D animation companies
2) To study the factors influenced 3D animation production in Thailand, the development, and qualification of the employees in animation industry

III. Literature Review

In one of past related study, Meenanan [9] has reviewed the concepts, frameworks, and theories about Thai entertainment media, which the researchers of the current study adapted them to use as the research approach. All literature reviews can be classified into the following sub-topics.

A. Perception Theory

Based on Howard's paper [3], the perception was the visual ability to perceive the world in three dimensions (3D). Depth perception could be perceived by two eyes. This is called, binocular cues. With the single eye, human cannot perceive

the third dimension of the objects around him or her. The only things that a single eye can perceive are size and angle of the object, which is called, monocular cue. Human visual perception is initiated by two eyes and the lens which have the qualification as similar as the camera lens. When we look at something intentionally, it will be clear. The clear or blurred images depend on the distance of vision, brightness and darkness. The brain transduces the pixel, depth, and dimensions of the images, and it converts the patterns of light into neuronal signals. These signals are processed in different parts of the brain, from the retina upstream to central ganglia in the brain.

B. Process of 3D Animation Production

There are three main processes for animation production which are (1) Pre-Production Process, (2) Production Process, and (3) Post-Production Process [5], [6].

1) Pre-Production Process or the Preparation Process is the beginning process of animation production, including: outlining, planning, budgeting and resource management. The animators need to identify the concept, idea, topic outline, storyline, script, character design, drawing, art direction, and storyboard. The final output of this process is the storyboard which is used for the next process. Storyboard could show the draft of overall animation, which must be understood by the teamwork. All are the process of pre-production. Things to do in this process are screen writing, script writing, character design, scene design, camera angle design, storyboard, and previsualization. During this process, all staffs have to come up with new ideas and discuss with the team. Listening and accepting the ideas of team will lead the best development of the projects.
2) Production Process is the process of animation production. The animator will create an animatic storyboard to test the sound, shot length, and camera angles. After everyone in the team feels right with the animatic storyboard, they will move on to the next step, which they would work around fine art, modeling, textures, lighting, animating, visual effects, rigging, simulation, shading, rendering, and programming. Generally, people think the animation is a kind of artwork. The production staff should be educated in the basic principles of art. They need to know what most people accept as beauty, and what they cell disturbing. At the same time, the texture staff should have the ability to draw and paint. The computer experts are needed for the animation production. During the production, the large project requires a lot of computers with high capacity, so the system maintenance staff should work well in supporting the team.
3) Post-Production Process is generally known as the process that animators combine all rendered video files from the previous process and put them together as the single video. They also add sound effect and visual effect. The additional work in this process is varying, depending on the broadcasting media. For example, it requires the making of pre-loader, pause-stop-play function, if the animation is published in DVD.

The literature review showed what Thai animator and instructor in the school of animation knew about animation. There was little known about the actual animation production process in Thai animation industry. The current study would fulfill the knowledge in this field, which would benefit animation students and educational institutes.

IV. Method

The exploratory research design was used to explore two objectives, which are (1) to understand the qualification of employees that media organizations may require, and (2) To indicate the capacity of animation production in Thailand. The researcher interviewed three key informants who worked in 3D animation industry, the questionnaire was built based on the results of thematic analysis of interview data. SPSS 19 (Statistic Package for the Social Sciences) was used for descriptive statistic analysis. The researchers would like to note that the results in this paper would present the quantitative finding before the qualitative finding, since it could provide the overview data about the animation industry in Thailand, before getting to know a detailed data from interview session.

A. Qualitative Phase

Because there was lack of the research studies in this area, especially in Thailand, the researchers began to explorer this topic by using qualitative method to understand the structure of animation production industry as a whole. The researchers interviewed three key informants who worked in high position in animation production companies in Thailand. At the beginning of the interview sessions, the key informants signed the consent form, and they allowed the researchers to spell their name and the name of their organization since they believed that it might benefit their business reputation by helping animation researchers. During the interview sessions, the key informants were free to add more information that they needed the public to know about their organizations. The list of topics that researchers intended to ask the key informants were the main software used in animation production and visual effect creation, the reason behind using the particular software, the characteristic of animation employees, the reason of choosing such the employees with these characteristics, the working style, the company system, and clients of the company.

B. Quantitative Phase

The questionnaire was used to explore the attitude of employees in the animation industry. The samples of this phase of the study were 50 employees in the animation-related company in Bangkok. The data were collected from five employees working in each company. There were 10 companies selected by using cluster sampling from totally 76 companies in Bangkok metropolitan area. The questionnaire consisted of questions based on two main topics which were (1) demographic data, and (2) attitude of employees of

animation-related company. The first part of the questionnaire, demographic questions, was for gathering the data about respondents' age, education, salary, and work position. The measure of attitude of animation employees includes the questions about current animation software used in the company, required skills, capacity of the employees, character of the employees, and overview of problems, obstacles, and suggestions. Most questions in this part were ordered by the topics. Each topic contained more than one items to avoid bias. This part of questionnaire used 5-points-Likert scale (5 = most important, 1 = least important).

After the quantitative data was collected, SPSS was used to analyze descriptive statistic, including mean, stand deviation, and distribution of frequency. Since there was a comment space at the end of the questionnaires, the wording in comment part was coded as numeric data, which could be analyzed as descriptive statistic. Data were interpreted using the similar method in [4]. Scoring range between 4.50 and 5.00 means "the most important", 3.50-4.49 means "very important", 2.50-3.49 means "somewhat important", 1.50-2.49 means "not important", and 1.00-1.49 means "the least important."

V. Quantitative Results

The quantitative results showed that most respondents were 26-30 years old. Most of them received some diploma. Only few of them had bachelor degree from the university. As the lecturers in animation program of a public university, the researchers were surprise with this finding. This is because many universities provide the animation courses and degrees, and there are a lot of students in the programs. Since the respondents did not have bachelor degree, it might be the reason that most of them earn only 10,001-20,000 baht per month, which is not a high salary.

Most of these employees worked as animators and visual effect artists. This could be interpreted that if the students need to work as the employees in animation industry in Thailand, they need to be able to animate the characters and to create the visual effect. The result from the questionnaire supports the finding of qualitative interview that most companies used Autodesk Maya and Autodesk 3Ds Max as the main computer programs to produce the animation and visual effect. The researchers suggest the animation student to intensively find the way to improve their skills in using these two programs. There is also a good opportunity for the student that Autodesk website offers the student license software for the students and instructors to use for free. This means the students will be able to practice their skills and knowledge of using these two programs without any expense. 3Ds Max is a capable software, not only because its realistic rendering, but there are also various plug-ins for creating numerous special effect. Moreover, as the experience of the researchers, if the students know how to use these two programs, they will be able to learn other 3D programs easily.

TABLE I
General Demographic Question

Age Range	Frequency	Percentage
26 – 30 Years	22	44
20 – 25 Years	18	36
31 – 35 Years	10	20

TABLE II
Education

Education	Frequency	Percentage
Undergraduate or above	10	20
Diploma / Vocational	40	80
High school	0	0

TABLE III
Salary per Month

Salary Range	Frequency	Percentage
10,001 – 20,000	27	54
20,001 – 30,000	14	28
30,001 – 40,000	9	18

TABLE IV
Work Position

Work Position	Frequency	Percentage
Director / Producer / Management	2	4
Artist / Storyboard artist	2	4
Modeler / Texture artist	5	10
Setup / Rigging	3	6
Animator	14	28
SLR	2	4
Visual effect artist	10	20
Composite	5	10
Editor	2	4

TABLE V
Animation Software and its Importance in Making Animation

3D Software	x	S.D.	Importance
Maya	4.75	0.47	The most important
3DMax	4.5	0.51	The most important
Real flow	4.34	0.48	Very Important
Lightwave	1.0	0.21	The least Important
Rhino	0.5	0.12	The least Important
Cinema 4D	0.4	0.1	The least Important

The next important program is Real Flow. It could help the animators create the water effect. Lightwave, Rhino, and Cinema 4D are not very popular among animators, because these programs were designed suitable for using in architecture, engineer, and interior design organization. Houdini was an important program that the key informant from qualitative phase had mentioned. This software could be used to create various special effects, but the price for the license might be too high for the animation companies to purchase. There were also other related programs that were used in animation production company, such as the program for file editing, sound editing, and for composition work.

Another part of the questionnaire was to ask the opinion of the respondents. They would need to evaluate the importance of the given factors that encouraged them to product a high-quality animation. The results showed that the salary and

human resources were the most important factors. These two factors were related to each other, since a high-quality of human resources, the employers would need to pay a high salary for them. Time is another important factor that the employees required for creating a good-quality animation. Time does not only refer to the amount of time for animating the cartoon characters, but animators also needed enough time to render their work to be the final video files, Movie script and plot were also very important, since the good script will make the movie or advertising interesting.

TABLE VI
FACTORS IN MAKING ANIMATIONS

Factors	x	S.D.	Importance
Income	4.89	0.51	The most important
Human resources	4.75	0.48	The most important
Time	4.5	0.41	Very Important
Movie script	4.45	0.51	Very Important
Design	3.46	0.3	Somewhat Important
Equipment	2.1	0.22	Not Important
Support from government	1.1	0.11	The least Important

TABLE VII
FACTORS AFFECTING THE STAFF POTENTIAL BEFORE STEPPING INTO THE ANIMATION INDUSTRY

Capabilities	x	S.D.	Criteria
3D Software Skill	4.95	0.46	The most important
Experience	4.94	0.51	The most important
Responsibility	4.51	0.44	The most important
Teamwork	4.45	0.49	Very Important
Good Portfolio	4.33	0.39	Very Important
Endurance	3.97	0.42	Very Important
Finesse and Diversity in Programming Skill	3.86	0.33	Very Important
Creation	3.74	0.27	Very Important
Animation Skill	3.56	0.31	Very Important
Movie Skill	3.21	0.25	Somewhat Important
Art Skill	3.10	0.31	Somewhat Important
Alacrity	2.86	0.23	Somewhat Important
Communication Skill	2.30	0.11	Not Important
Appropriation	2.32	0.18	Not Important
Leadership	2.24	0.22	Not Important
General Knowledge	1.96	0.28	Not Important
Self-Confidence	1.51	0.14	Not Important
Politeness	1.2	0.08	The least Important

The most important factor that allowed the individual to step in to the animation industry I Thailand was 3D software skills. The employers did not require much creativity because the employees would work based on the idea of the employers and the idea of the clients of the company.

The result from this part of the questionnaire could support the previous finding that most employees did not have a bachelor degree. Since 3D software skill was the most important factor that caused an individual to step in to the animation industry, the individual could gain this skill from anywhere, and they did not need to take a course or get a bachelor degree in order to have a 3D software skill.

It was generally known that to take a class in the university, the students will learn various skills, such as ability to think, creativity, management, etc. However, the employees did not require all these skills in order to hire someone to work in the company. The result may seem strange that the respondents did not find the importance of politeness. It might be because the working climate in animation related company is homosocial. Male employees could talk to each other without politeness. This could be a specific communication style that we could not find in any previous research study.

The researchers looked forward to the next generation of 3D animation industry in Thailand that the employees will need to think and need to have more creativity than before. The employers should realize that the employees are not just robots or machines that do everything along the command, but they are people who have more value and ability to think by themselves. Another thing that the researchers expect to see in the future is the communication with politeness. The politeness makes the individuals seem professional, and provide the opportunity to communicate to other people outside the company.

VI. Qualitative Results

After the researcher used a thematic analysis to analyze in-depth interview data, six themes were listed and discussed as following.

A. Characteristics of the Organizations

Mr. Boonuppatum, the entrepreneur of Lunchbox Studio, described that his organization processed two types of projects, (1) working on other organizations' project, and (2) working in the organizations' own project. The main source of profit was from the project of other organizations. As the fact that most animation organizations in other countries have created the work based on their own copyright characters, Mr. Boonuppatum looked forward to the future of his organization that should make it more profit from their own project, too. Currently, it is in process of finding a supporting fund for such the project.

Lunchbox Studio hired thirty full-time employees. Most of them have worked for this organization since Mr. Boonuppatum founded the company, 10 years ago. Three of them graduated from other countries, and others graduated from Rungsit University and Sripratum University. All of them have the bachelor degree of Animation.

Mr. Ontanalai, the director of Riff Animation Studio, described his organization as a professional animation production company that can work in all pre-production, production, and post-production process. This included script writing, animating, advertising, and working in special effect for movies.

Riff Animation Studio was founded, 4 years ago. Although this company was found after the first company, this company has hired a larger number of employees. This might be because they worked in various types of projects, owned by foreign companies, such as the companies from Denmark, Germany, and Japan. There was only one-fifth of the projects, which this company worked for Thai organizations, such as

MAY NAI (2015) and Bloody Rabbit. For Bloody Rabbit, it was broadcast in Cartoon Network channel.

Riff Animation Studio hired 40 employees, where all of them have their own responsibility. Unlike many organizations in Thailand, an employee can work in various positions. This structure was borrowed from Pixar Animation Studio. Riff Animation Studio involved four employees in art team, seven employees in modeling team, twenty five employees in animating team, three employees in lighting and rendering team, three employees in visual effect team, and five employees in composite team. Most of them had bachelor degree of Animation, from various universities in Thailand. Only few employees were European. The range of salary is 15,000 – 50,000 baht (around 500 – 1,667 USD). The software that was frequently used is Autodesk Maya.

Mr. Chainithikun, the visual effect supervisor of Yggdrsill Group provided the information about his company that his company worked on various advertising and gaming projects. These projects were owned by both Thai and foreign organizations. The foreign organizations were from Indonesia, Melaysia, China, India, the United States, and also European countries. Generally, this organization worked in advertising projects, but sometimes, they also work in small projects, such as green screen removing, motion tracking, etc. The organization also owned an online game project. This game could be used in mobile device.

Yggdrsill Group hired around 100 employees. Three of them were foreigners, because they could help communicate with foreign organizations. The range of salary is 18,000 – 80,000 baht (600-2,666 USD). The average salary is around 20,000-30,000 baht (666-1,000 USD). The salary would depend on the experience of each employee. The positioning in Yggdrsill Group were, 15 employees as producers, 5 employees in storyboarding team, 8 employees in modeling team, 10 employees in animating team, 30 employees in 3D effect team, 8 employees in dynamic team, 8 employees in rotoscope team, 20 employees in composite team, and 15 employees as game developers.

Based on these results, it shows that the majority of the profit of these organizations was from working for other companies. A large number of these projects were owned by the foreign companies. This could be the reason that these Thai organizations need to hire foreign employees to help communicate with their foreign clients.

B. Animation industry in Thailand

Mr. Boonuppatum is the only key informant who provided the data about animation industry in Thailand. This might be because he was the only key informant who was the entrepreneur. Mr. Boonuppatum believed that the animation industry in Thailand was growing, but the growth rate was slightly slow. The main problem was the supporting fund to hire the employees to produce such the project. All employees needed to have the experiences and skills in animation and visual effect. The companies also needed to buy the expensive computers and programs for their employees to produce the work. To render a large video project, it requires a computer with a high capacity, and to get an elaborate work, it requires a high-resolution screen monitor.

Although various digital television channels were recently founded, the animation series made by Thai organizations have lack of opportunity to be on scene. This is because these new digital television channels did not have enough funds to purchase the Thai animation series. This situation caused these Thai animation organizations to look for international TV channels and sale their projects to them. Lunchbox Studio was also one of these Thai organizations that were looking for the foreign TV channel to broadcast their work.

Late 2015, Thailand became a part of ASEAN Economic Community (AEC), and it would have an important effect on animation industry in Thailand. Although some people may see it as an opportunity to have new foreign employees from other countries in AEC to work for the companies, Mr. Boonuppatum did not agree with them. Most foreigners, who sent job applications to his company, requested a high salary, that his company could not offer. This means, being a part of AEC did not benefit Thai animation company. Moreover, many Thai animators may look for the company outside the country, such as the company in Singapore. The skillful employees might leave Thailand, and go to such that company to gain a higher salary.

There might be a good opportunity to get Thai animation project to broadcast in foreign channels in ASEAN. Most countries in ASEAN were just like Thailand, they could not purchase an animated series at a high price. Although Mr. Boonuppatum did not expect any benefit from being a part of AEC, he stated that he would not worry about how much his company would earn. The only thing he saw as an opportunity was to get his animated project to broadcast in other countries, which would make his company more famous.

C. Supporting from the Government

Mr. Boonuppatum introduced government organizations, Software Industry Promotion Agency (SIPA), and Thai Animation and Computer Graphics Association (TACCA), which help support Thai animation organization in many aspects. For example, they presented Thai animation projects to foreign organizations, which was the way to persuade them to purchase Thai animation series to broadcast in their countries. The latest event was Animation Asian Summit, which was the corporation between animation production companies from Thailand, Korean, Malaysia, and Australia. This yielded a great outcome for Mr. Boonuppatum's Lunchbox Studio, where three foreign capitalists were interested to buy his animation project to broadcast in Cartoon Network channel.

D. Working Process and Structure of the Company

Mr. Ontanalai described the animation production process of his organization, that all of these processes were like a pipe line of a factory. The project would flow from the beginning to the end. There was no returning point between three main processes, pre-production, production, and post-production. This implied that every project needed to have its own plan. If

everyone could work along the plan, one would have less pressure during working. The problem of working in a large project was that employees might be bored and begin to work slowly.

While Mr. Ontanalai gave information about working process, Mr. Chainithikul provided some great knowledge about the structures and position in his company. The structure of the company and the position of each employee could be adapted depended on each project. The sizes of each team could also be changed along the size of the project. For example, to finish 30-second advertising, it requires 5-8 employees, and requires a month and a half period. Every employee should be able to work in more than one position, and be able to work in several computer programs and create various types of visual effect. In the case of large project, an employee would be assigned to work in one visual effect all along the length of the animation or movie. For example, one would work in hair effects of all characters in one film.

Generally, the employees should start working at 10 o'clock in the morning and leaving at 7 o'clock in the evening. However, if they could not finish their work, they would stay in the office. The office provided them the beds and bathrooms, if they stayed overnight.

E. Relationship among Employees

Since most employees were around the same age and being fans of similar animated films, they could identify with one another and get together well in both work place and in their free time [7]. Mr. Ontanalai also presented his strategies to select the job candidate. He emphasized that the portfolio needed to relate to the position that each employee needed to work. For example, if one needed to work as animator, one should show one's work about animating, facial expression of the characters, and character body movement. Every employee should be able to use Autodesk Maya and 3Ds Max before one started working in his company.

Responsibility is one thing that Mr. Ontanalai and Mr. Chainithikul required for all employees. Every employee should be able to get the project done on time. Most of the time, working with the visual effect company, the employees would be pressured from the deadline given by the customers' companies. The employees should always improve their skills. This is because all computer programs often release new version, new feature, and new plug-in. Learning how to use them was one of the responsibility of the employees.

F. Software Used in the Projects

Mr. Chainithikun gave a list of software used in this organization. Mainly his organization used Autodesk Maya and 3Ds Max, and used some additional software, for water and dynamic effect, such as Realflow and Houdini. Maya was generally used for modeling the characters and animating the objects. Maya Cloth was assistive software to create the clothing effect. For 3Ds Max, it was suitable to create the effect, because there were various plug-ins, such as the plug-in to create bombing, fire, water, rain, and dust. There were also some other softwares to work with composite project, such as After FX and Nuke.

VII. Discussion

To answer the research questions and to follow the objectives of the current study, the researchers emphasized two points, (1) to analyze production process, working structure, and computer software usage to find out the overall capacity of animation organization in Thailand, and (2) to understand the factors that might influence the production process, such as employees, where would help suggest the strategies to heighten their skills in the future. The discussions of this part are listed as following.

A. Types of Animation Organizations in Thailand

After the interview of three key informants, the researchers found that the animation organizations in Thailand can produce two kinds of animated project. These two kinds of project can divide the companies in Thailand into two types. First, Animation studio company will produce animation to serve television series, movies, and animated advertising. Second, visual effect company will produce visual effect in advertising and movies. Table VIII shows the similarity and difference between animation studio and visual effect company.

TABLE VIII
The Comparison between Animation Studio and Visual Effect Studio

Factors	Animation Studio	Visual Effect Studio	Comparison
Output	Animated film or cartoon	Visual effect	Different
Copyrights or License	Hired by other company, but also produce one's won work	Hired by other company, but also produce one's won work	Similar
Channels to publish the work	TV/Cinema	TV/Cinema	Similar
Flexibility of process	Procedures of all projects are similar.	Processes are flexible, depended on each project.	Different
Time spending in one project	Around 3-4 months and up to a year.	Short period of time. Around 3 months	Different
Employee	30-40 Employees with various positions.	7-8 employees	Different
Office hours	Office hour is 10.00 AM – 7.00 PM, but practical hour is flexible.	Office hour is 10.00 AM – 7.00 PM, but practical hour is flexible.	Similar
Salary	15,000-45,000 baht	20,000- 80,000 baht	Somewhat Different
3D software	Maya	Autodesk Maya, 3Ds Max, RealFlow, additional plug-in	Visual effect studio uses more various computer programs.

B. 3D software Generally Used in the Company

Generally, the company used Autodesk Maya and 3Ds Max. These two computer programs were easy to use. Maya was suitable for modeling the characters and also for animating them. 3Ds Max was suitable for visual effect project, because it allowed the animators to install various additional plug-in.

Other 3D programs were also used to create some special effect, such as Light wave. In some architecture drawing, the employees needed to use Rhino and Cinema 4D to get the right structure system for the building.

C. 3D Software Generally Used in the Company

Although animation industry in Thailand has been slowly growing, the quality of work always gets better every year. Lately, there are a larger number of foreign companies hiring these Thai organizations to produce the work for them. Most of these projects are advertising. The government also supports by providing the opportunity for these organizations to meet foreign capitalists.

The main problem of animation industry was the supporting fund. An animated project required many animators with various skills, and also required expensive computer programs, and electrical expense. After many digital television channels were founded, these channels have less supporting fund, compared to the earlier analog TV channels. This is because media organizations have to spend a lot of money to run these additional channels, and have less money to purchase good television programs for their broadcasting.

As the results, animation production companies try to produce the work with their own copyright, where would be a long term solution. The company would receive the supporting fund directly from the sponsors, and gaining a long term income from the copyright or license.

The language was another issue that these organizations should concern. This is because if foreign capitalists wanted to purchase animated series from the company, the company needed to be able to communicate with them. It is not just a simple communication, but the communicators had to use rhetorical strategies to persuade them, too. To hire Western employees to work in Thai company was one of the solutions, but the best solution is that Thai employees should be able to communicate in English by themselves. If the company could do this, they would not need to spend a lot of money to hire the Western employees.

Although in AEC era, Thai animation organizations might hire a lot of foreigners from surrounding countries, it is possible that these Thai organizations will lose many skillful employees to other country, such as Singapore. The skillful employees would look for other organizations that could pay them a higher salary. Animation organizations in Singapore have a higher standard and reputation, and they have been also supported by various foreign capitalists.

D. The Way to Improve the Quality of 3D Animation

There were three variables that might affect the quality of 3D animation in Thailand. First, skills and experience of the animator, the animation production needs skillful and experienced animators. Generally, animators could find the job in animation studio company, and if they were able to create visual effect and composite work, they could also work for visual effect company. Visual effect company could provide them a higher salary compared to animation studio company. However, working in animation studio company, they would have less pressure during working. First of all, every animator should understand their own potential, and should be able to choose positions suitable for them before sending a job application. There are various positions, and each position has its own kind of work. The organization needed to see these animators to speak by themselves about their own proficiency.

General requirement of every 3D animation company was ability to use 3D programs. Most of these companies were hired by other companies, so every employee should have a responsibility to finish the project within deadline. Communication skill was another important factor that every employee should be improved. They needed to be able to work with other people in the organization. The structure in animation organization was like a network that everyone has to corporate with each other and gets the project finished. Some personal traits that might not be required were self-confidence and politeness.

The second variable that could influence the quality of 3D animation was fund and employees' salary. A high level of salary is an important factor to persuade skillful employees to work in the company. Moreover, a high level of salary could motivate the employees to produce a high quality of work.

The last factor that influences the quality of 3D animation project is the given period of time. To produce a good animation, the team needed to think about the plot, design the look of the characters, design the traits for the characters, and create 3D models elaborately. Normally, the quality of the project with a longer period of time will be better than the quality of project with a short time period.

Purchasing a high-capacity computer was not a problem, because nowadays, the price of computer is lower than before.

VIII. Suggestion and Future Study

A. Suggestion

The entrepreneur should aware much about the quality of projects. This is because the industry has been growing and everyone needs to run as fast as the growth rate. The organizations should also create their own copyright project to heighten their reputation, and gaining a long term profit from the copyright work. The entrepreneurs should also use some strategies to improve English language skills for their employees. This is because the employees should be able to communicate in English directly, to the foreign clients whenever that the companies have the opportunity to work in the foreign projects or to work with foreign organizations.

For the employees, they should prepare themselves before sending job applications to the companies. They should prepare their portfolio related to the position that they need to work. Moreover, they should also improve their personality, such as responsibility, enthusiasm, communication skills, and also ability to use various computer programs.

The researcher also suggested the school of animation to provide the course about the important software, Autodesk 3Ds Max and Maya. Ability to use these two programs is the basic requirement for many animation companies. The

instructors in this field also need to teach their students to have a high responsibility and to respect the rule and tradition of the organization.

B. Future Studies

The current studies explored the problem, the need, and the tendency of animation industry in Thailand through the point of view of animation business. The future study should look forward to understand the policy of the government. This is because the government is the one who support many animation projects and industry. To understand the point of view of the government would help the scholars and the business to realize the problems and obstacle in animation industry. It might also help the school of animation to able to prepare their students and arrange a suitable course for future industry.

The future study should also interview new employees who just start working in animation companies. This is because these informants could indicate how much skill or qualification that the organizations need. This information could also help suggest the school of animation to decide what courses should be provided.

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