EXAGGERATION PRINCIPLE FOR CGI CHARACTER VISUALIZATION: A FRAMEWORK FOR PANGLIMA BUKIT SADOK

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Field of Study: CGI Character Visualization

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ABSTRACT

This research gave focus to study exaggeration principle which already proven internationally by many well-known animation studios to be the key for the success of stylized CGI character visualization. Even though many existing literary works introduced and recommended the implementation of exaggeration principle in character design development, but apparently, there is no literary work that offers a comprehensive documentation, knowledge and insights to describe specifically on the methodology of how exaggeration principle could be implemented with the relevant visual attributes and how it could be linked to others animation principles in the development process of CGI character visualization. In align with this study, the researcher had adopted his existing practical project of 2013, CGI character of Panglima Bukit Sadok as the case study. The researcher made an effort to study from the CGI character visualization industry experts in order to obtain a special kind of information within the scope of area. This study approach is aimed to develop a set of framework as a guide to aid the problem resolving process of Panglima Bukit Sadok CGI character visualization. Ultimately, this framework could also serve as one of the useful references for any practitioners as well as inspires future research on the development of local CGI character visualization.

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CHAPTER 1: INTRODUCTION

The research of CGI character visualization has been widely focused on generating realistic 3D model. Many approaches were proposed already for addressing the technical difficulties that one encounters when following this path. However, the interest in this paper is not toward too much of technical approach. The study would be focused into exploring the performance approach. In the context of CGI character visualization, the performance approach refers to the study of CGI character creation in representing the essence of personality in appearance.

In the year 2013, the researcher worked on the CGI character visualization of Panglima Bukit Sadok upon the request from the local scholar, Aloysius Yapp. The completion of this CGI creation was published by National Library of Malaysia, in the book entitled, *Culture Preservation: Panglima Bukit Sadok in a form of CGI (ISBN 978-967-11950-0-0)*. A year later, in 2014, the work was presented by researcher in 7th International Conference of University Learning and Teaching (InCULT 2014). However, this book gave visual documentation more towards the technical based studies of the project. In fact, the CGI creation of Panglima Bukit Sadok in 2013 was designed and generated by the researcher without based on any guide of framework, even though certain feature appearance had been exaggerated to stylize the character. The process of idea development till work execution was totally done according to the researcher's own preferences, skills and knowledge. Hence, the researcher had some doubtful with the creation when evaluating its expressive quality. This existing project of Panglima Bukit Sadok CGI visualization became an initial approach that stimulated the researcher's idea towards the issue on how should the exaggeration principle which adopted from 12 animation principles could be implemented in CGI character visualization with a proper structured of framework as a guide. The researcher believes that a well-structured of

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framework should be a guide to be based on while creating a new version of CGI Panglima Bukit Sadok in future.

In order to conduct this study, the researcher looked for the best way to obtain the genuine data and information. The researcher made an effort to get the assistance from few CGI experts in the industry as the study participants that expected to give their views and perceptions about their knowledge in exaggeration principle application and common practical ways in handling their CGI character visualization work. The reviews and advises had been given by them in order to enhance the quality of CGI visualization of Panglima Bukit Sadok.

1.1 Research background

The CGI artist does have the role of creating the 3D computer graphic, which can be used to simulate real life object. This is to say that the main objective of the CGI artist is to create the illusion of an authentic, living, cognitive being with movements that seem to come from an inbuilt motivational force (Thomas & O. Johnston 1995).

Public forum of CGI artists revealed that successful CGI character visualization often implement the traditional twelve principles of animation which have already been adopted widely since long ago as the main factor in conveying a clear situation to the audiences more efficiently than physical realism. According to the book *Disney Animation: The Illusion of Life*, the exaggeration principle, which adopted from twelve principles of animation made the character animation more expressive. Frank Thomas and Ollie Johnston, two pioneer animators from Disney animation studio summarized brilliantly their attitude in applying exaggeration; 'If a character was to be sad, make him sadder; bright, make him brighter; worried, more worried; wild, make him wilder' (1995. p.65). Through this statement, it seemed that reality in character animation isn't realistic at all. It is reality exaggerated, that represents an expressive performance in stylizing

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character. The implementation of exaggeration should be proven worthwhile, because as Kostas Terzidis (2003) suggested, the expressive has many advantages over the realistic and, whereas the computer-graphic quest for realism is essentially about completeness, 'notions of incompleteness, imperfection, and subjectivity' invite interactive participation and have an expressive value that can surpass this explicitness.

SAs Michael Davis (1999), a specialist in Greek philosophy and translator of Aristotle perceived it, mimesis should comprise ‘a stylizing of reality in which the ordinary features of our world are brought into focus by a certain exaggeration . . . like the relationship of dancing to walking’ (p. 3). This seems to be referring to classical theater performers who presented their acting with exaggerated actions and emotions that technically works as a purpose to capture the audience’s attention in the big theater hall. The body gesture and facial expression of performers are presented in more extreme or wilder than the reality becomes a well applicable language to communicate clearer with the audiences. In this modern days, the implementation of this classical exaggerated reality concept is perfectly relevant to character animation. It becomes one of the useful principles to be applied in any character animation.

The exaggeration principle as what had been discussed earlier are meant to be used for this purpose. This research is an attempt to give an in-depth exploration to exaggeration principle which become a main key in developing a proper framework for CGI character visualization process. Of course, the researcher knows the implementation of exaggeration principle is not new in the field of CGI character creation and it has been used and implemented widely long before this. However, through existing literary work, there is still a lack of comprehensive documentation and shared knowledge about the framework which elaborate the method of how exaggeration principle could be implemented.

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In essence, developing one unique CGI character visualization can mean serving numerous and diverse audience across the globe because this new media representation is easily understood irrespective of the age bracket. However, while it is natural to refine the design process of CGI character visualization with appropriate framework in order to ensure for the easily understandability. It is also important to note that injecting cultural features can really help to differentiate one design of CGI character creation that outstandingly appeal apart from the rest by establishing the unique visual contents based on one truly cultural essence. This establishment of visual uniqueness creates an identical impression to the audiences. The design of CGI character creation could be easily recognized and understood by audiences as it belongs to a certain group of community or region. This commonly understood to be character style by people in the industry. Thus, the fact that CGI character visualization for animation industry in Malaysia still on the way towards expanding its unique offering by differentiating its own CGI character style from that of pioneering Americans and Japanese is very appropriate. To make it clear here, the researcher has taken exaggeration principle as main study approach. The candidate studied on why and how exaggeration principle should be implemented to enhance the performance of character. In the view of the above discussions, this paper will focus on understanding as well as exploring how exaggeration principles could be applied in the design development of CGI character visualization for Panglima Bukit Sadok and the overall benefit of such a well- structured framework.

This research is to be focused in exploring few relevant principles which could adopt from 12 principles of animation. Exaggeration principle stands as a key principle here to give effects to many aspects in CGI character visualization. The critical studies of those relevant principles have to be looked into their influence toward the physical appearance of characters in the form of CGI model.

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John Lasseter, director of *Toy Story* among others (Pixar, 2010), explained that a scene has many components, including design, action and emotion, and exaggeration can be applied to any of these components, but not in isolation (1987, p.41). Complying within the area of CGI character visualization, this means that the exaggeration is an important principle and effects the narrative design of the character. It is not to be considered as a standalone principle by itself but it is meant to be applied mainly with other interrelated components from animation principles. In fact, Pixar and Disney Animation Studios presented the brilliant outcomes of exaggeration principle application on characters as figure 1.1 were consistently impressed many people.

Figure 1.1: Images courtesy of Pixar and Disney Animation Studios

Why Panglima Bukit Sadok character was chosen as a case study for this research? As what had been stated earlier in the introduction of this chapter, the researcher had been working on the CGI character visualization of Panglima Bukit Sadok project since 2013. Indeed, the researcher managed to complete a first version of Panglima Bukit Sadok CGI character at the end 2013. The completion of this CGI creation was published by National Library of Malaysia, in the book entitled, *Culture Preservation: Panglima Bukit Sadok in a form of CGI (ISBN 978-967-11950-0-0)* (as figure 1.2). A year later, in 2014, the work was presented by researcher in 7th International Conference of University Learning and Teaching (InCULT 2014). The obtained recognitions through this project had given some motivation for the researcher to drive further into his passion towards CGI character visualization, specifically on the study of exaggeration principle implementation.

Indeed, the researcher had taken exaggeration principle as main study approach. The researcher gave emphasis on the implementation of exaggeration principle, its relationship with others related components of animation principles and the expressive quality that expected to be achieved. In another statement of saying, the researcher would study on why and how exaggeration principle should be implemented to enhance the performance of character's appearance. In order to apply the exaggeration principle, the researcher needed to seek for the in-depth understanding of how the exaggeration principle links to the other components of 12 animation principles such as staging principle, appeal principle and solid drawing principle which introduced by Ollie Johnston and Frank Thomas in the book, *Disney Animation: The Illusion of Life*. The researcher intended to apply those existing principles in constructing the framework. Therefore, the aim of the study is eventually to propose a framework for CGI visualization as a guide for the enhancement of Panglima Bukit Sadok CGI character visualization in future.

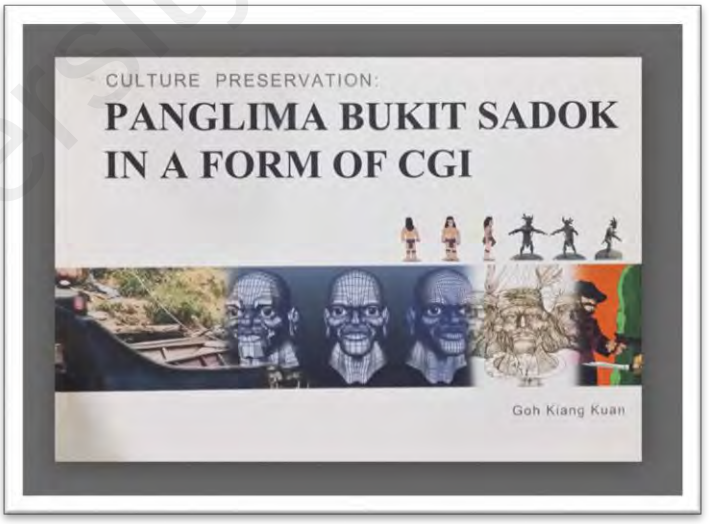

Figure 1.2: Book publication in 2013 by National Library of Malaysia

As it mentioned earlier, this research is an extended approach to study from the existing research of the local scholar, Aloysius Yapp. In this research paper with the title: *The process of developing the arts of Panglima Bukit Sadok PBS (Warrior of Mount*

Sadok) (2014), Aloysius Yapp gave the treatment of warrior from Sadok hill or Panglima Bukit Sadok was meant to be recorded and preserved through the art of the new media. The purpose of his study is to promote the process of developing the art of illustration in preserving the culture heritage of Panglima Bukit Sadok. In the research paper, Aloysius had recommended for future research that becomes a cutting-edge approach toward the preparation of other media in terms of narrative presentation or exhibition master piece. (2014, p.7). Therefore, the identified research gap from this existing research has to be extended into developing the other media such as CGI character visualization. However, it is important to be highlighted here that the research would not to be focused on the humanity study of Iban warrior culture phenomenon. The previous research of Aloysius Yapp had already covered the source of knowledge about Iban warriors, specifically on Panglima Bukit Sadok, which is already sufficient to be used by the researcher in his scope of study.

Figure: 1.3: The Arts of PBS- The warrior from the south of Mount Sadok by Aloysius Yapp (2014)

This research gave emphasis to study exaggeration principle which already proven

globally by many well-known animation studios to be the key for the success of great character stylization. Even though existing literatures introduced and recommended implementation of exaggeration principle in character design development, but so far there is no single literature that provides a comprehensive documentation, knowledge and insights to describe how exaggeration principle could be implemented and how it could be linked to others principles in the process of CGI character visualization. Therefore, the research is an attempt to develop a proper framework for CGI character visualization process based on the further studies from CGI character visualization experts.

1.2 Research Aim

To **structure** a proper framework for CGI character visualization of Panglima Bukit Sadok.

1.3 Objectives of Research

The objectives of this research are:

1.3.1 General Objective

To implement the exaggeration as a principle in enhancing CGI character visualization of Panglima Bukit Sadok. Based on the understandings gained from the above elaboration, this research will be expecting to develop appropriate framework to show the way how Exaggeration principle to be implemented in the process of creating an expressive CGI character based on this local existing content. This research will adapt an existing local historical content. The CGI character of Panglima Bukit Sadok is to be under taken as the case study.

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1.3.2 Specific Objective

i. **To determine the importance of exaggeration as a main principle in CGI character visualization.** In general, the CGI character visualization are widely taught by focusing too much on technical based studies. The CGI artists are exposed to the techniques of latest industry mainstream CGI software such as Zbrush, Autodesk 3D Max and Maya. The coverage of knowledge delivery in performance based studies by giving emphasis on exaggeration principle are not much put into effort.

ii. **To justify the relationship of exaggeration principle with other components of principles.** The twelve animation principles have been a guide for character animation production in the industry since decades ago. However, these principles are understood with their own individual functions and purposes. In a seminar paper with the title: *Principles of Traditional Animation Applied to 3D Computer Animation,* John Lasseter (1987, p.41) explained that character animation has many components, including design, action and emotion, and exaggeration can be applied to any of these components, but not in isolation. This means that the exaggeration is an important principle in CGI character visualization and effects the narrative element of the character design. It is not to be understood as a standalone principle by itself but it is meant to be applied mainly with other interrelated components animation principles. Therefore, this research will also be seeking for a deeper understanding on how exaggeration principles as a main principle links to the relevant animation principles such as staging, appeal and solid drawing/solid design.

iii. **To define the expressive quality in CGI character visualization of Panglima Bukit Sadok.** This research is also an attempt to investigate the real meaning of **expressive quality** in the context of character visualization. Any successful

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exaggerated CGI character claimed to have **expressive quality** which could relate towards psychological aspects of how CGI character engages to the audience's interest. The achieved expressive quality in character should be able to convey a clearer informative visual representation and memorable impact to the audience. The study should be looked into how and what expressiveness of exaggerated character in bringing certain uniqueness to the visualization, as well as reflecting character identity. Thus, the study could be approached through gaining the perceptions from relevant industry expertise.

1.4 Statement of the Problem

In today's animation industry, one of the most attractive element in CGI character visualization is the character that could able to perform its expressive personality, representing the lifelike human and expression without any physical limitation. In 1970, Masahiro Mori, a Japanese roboticist published "Bukimi No Tani" (English title: The Uncanny Valley) in *Energy*. The article forwarded the problem statement that as robots or CGI characters become more humanlike, they appear more familiar until a point is reached at which subtle imperfections of appearance make them look eerie. Mori says, 'is the result of a basic human tendency to look for anomalies in the appearance of other human beings. When an object such as a robot or a CGI character is so anthropomorphic that it is nearly indistinguishable from a human being, we monitor the appearance of that object very closely and become extremely sensitive to any small anomalies that might identify the object as not fully human. For whatever reason, these anomalies create in many people a shudder of discomfort, similar in effect to the feeling we have when we watch a zombie movie or see an actual corpse'. In both cases, what viewers see is both human and not fully human, and the contradiction produces a very negative reaction.

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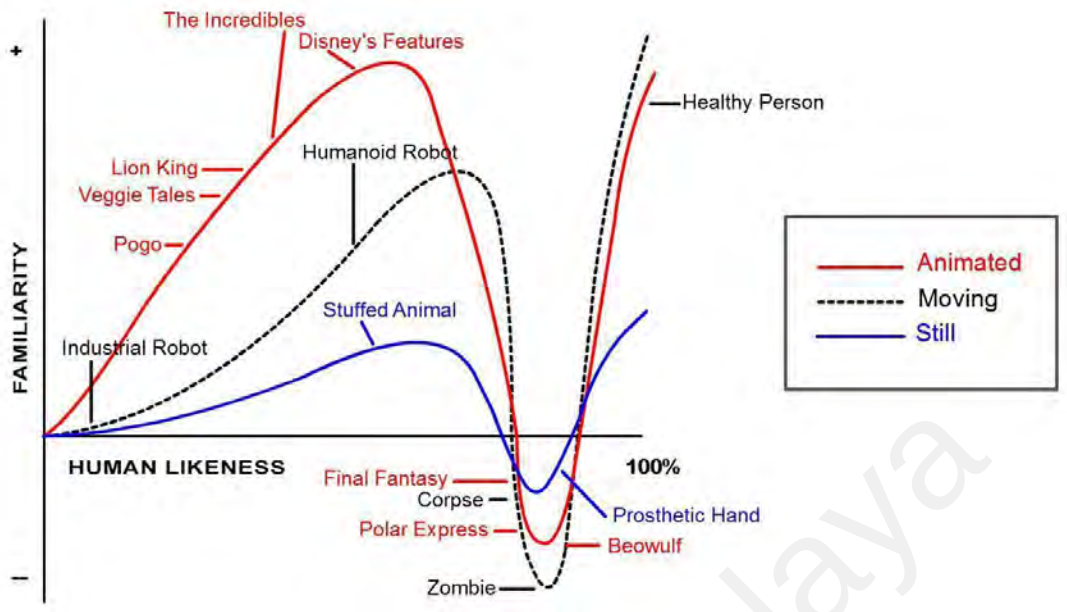

Figure 1.4: The Uncanny Valley chart. (MacDorman, 2005)

The above version of the chart is edited based on the Mori's theory to show the new media character visualization, animation and live action to give you a better understanding of what Uncanny Valley is and how characters are judged. At a first glance people will notice that the most "commercially" successful animations and live actions all hit the high graph and the ones that failed at the box office all fall well below the graph of plastic or lifeless.

In order to personally experience the theory of Uncanny Valley, the researcher had made his effort to do some simple experiment in the year 2012, by exhibiting his own CGI character creation of Tun Dr Mahathir (Figure 1.5) in the gallery at Universiti Tunku Abdul Rahman intentionally to get some responses from general viewers towards this CGI representation. Through this experiment, the researcher found negative reviews from majority of viewers. Although for some extent, the CGI character of Tun Dr Mahathir might look realistic, but majority of viewers still felt uncomfortable with some parts of facial detailing. From this experiment, it revealed that uncomfortable feeling one gets

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from looking at a digital recreation of a human being that looks almost human.

Figure 1.5: The CGI Creation of Tun Dr. Mahathir by Goh Kiang Kuan (2012)

The success of CGI character visualization relies on a set of principles that adopted from classical 2D animation techniques which meant to be a guideline syllabus for lot of CGI animation or visualization courses. Even this set of principles has been always the adopted mainstream research field in CGI character visualization, but there is still lack of comprehensive documentation, knowledge and insights on exaggeration principle as a main emphasis of principle among the 12 animation principles which previously introduced in the book *Disney Animation: The Illusion of Life (1981)*. This research intent to help the CGI character visualization students to see the important role of exaggeration principle in relating it to the others component of relevant animation principles.

The exaggeration is potentially meant to be used as a main guide to enhance the CGI character visualization by judging at the expressive quality. Thus, there is necessary to study the relevant principles adopted from the existing 12 animation principles as a guide for clearer and more in-depth theoretical framework, emphasizing the main role of exaggeration principle and its relationship with the other relevant components of

animation principles.

Importantly, on the other hand, this research also see exaggeration as a potential way to be explored in developing CGI character visualization that expressive enough to feature an Iban warrior, Panglima Bukit Sadok characteristic and identity. Basically, the above mentioned research problems could be summarized as below statement:

i. There is lack of understanding towards the importance of exaggeration principle in CGI character visualization.

ii. There is lack of well-structured framework to guide on how to implement exaggeration principle in CGI character creation, specifically as a good reference for Panglima Bukit Sadok CGI character visualization project.

iii. No literature with clear and in-depth theoretical framework to justify the relationship of exaggeration principle with other components of animation principles.

iv. There is lack of understanding towards the meaning of **expressive quality,** and qualities to be achieved in CGI character visualization.

1.5 Research Question

In order to get a right path for research direction, some research questions are needed to be pursued while conducting this research. These research questions are stated as below.

RQ: What are the **effectiveness** of exaggeration principle implementation for Panglima Bukit Sadok CGI character visualization?

RQ1: What are the **significant roles** of exaggeration principle in CGI character visualization?

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RQ2: How does the exaggeration principle **relevant** with the other components of animation principles in CGI character visualization?

RQ3: To what extent the **expressive quality** can be achieved in CGI character visualization of Panglima Bukit Sadok?

1.6 Significance of study

The research in CGI character visualization field is considered a new media studies. In Malaysia, this type of research is still considered new and not widely explored. The reason can be attributed to a number of factors which can stream from newly developing stage of local institutions for CGI character visualization studies to the small growing scale of local CGI visualization industry. In fact, the history of Malaysian CGI visualization and animation could only be recorded since not more than two decades ago. The involvement of today's local animation researchers who particularly study in the CGI character visualization for local culture preservation purpose is so limited. As such, these local animation researchers are very much depending on the studies source from foreign regions due to the broadly exposure to internet usage. The most updated knowledge of new media technology specifically in CGI character visualization are widely online shared by the CGI experts from all over the world. A recent survey found that young people use the new media as much and as often as possible (Ito, 2010) which seems to be a good reason to preserve local cultural contents for the young through this media. On that accord, it becomes very fundamental that related researches in the area of CGI character visualization are beneficial. Thus, a number of benefits are expected to stream down from this research and such benefits include:

i. By developing this research, it will benefit animation lecturers by

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supplying a useful framework for the animation students in Malaysia who study in CGI character visualization.

ii. The study is apparently one of the first attempt to give in-depth understanding towards exaggeration principle as an approach in creating CGI character based on the local historical contents. In this case, researcher has adopted the character of Iban great warrior, Panglima Bukit Sadok as the local cultural content to be explored. The treatment of warrior from Panglima Bukit Sadok is a good attempt to be recorded and preserved through the new media, such as CGI visualization. It is the transformation of the real-life character into a visual presentation by the new media. Indeed, this research is giving an enhancement approach to fill up a significant gap from the previous existing research, aligned with the mission of local cultural contents preservation.

iii. The research is considered more into performance based study rather than technical based study. Therefore, the structured framework is believed to be helpful to the current or future trend of new media artists in practicing exaggeration principle in their CGI character visualization work and judging their work performance through expressive quality.

iv. This research is also beneficial to the general public because it will help to expand the field of local creative contents in both educational and applicable contexts in order to further understand how CGI characters are transformed into real-life objectives with set objectives of educating the local cultural contents to the audience.

1.7 Scope of study

The study of CGI character visualization could be involved the performance based or technical based studies. However, this research is just to be focused on the performance

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based study. Due to the intention of researcher in targeting the CGI character of Panglima Bukit Sadok, some study in the aspect of Iban cultural characteristic is necessary to be conducted specifically the studies in some elements of character that should be portrayed in Panglima Bukit Sadok character based on the existing historical facts. Somehow, the researcher's study is decided not to be too much detailed on the issues of Iban cultural elements. The study would be emphasized on the implementation of exaggeration principle, its relationship with the others related components of animation principles and the expressive quality that expected to be achieved.

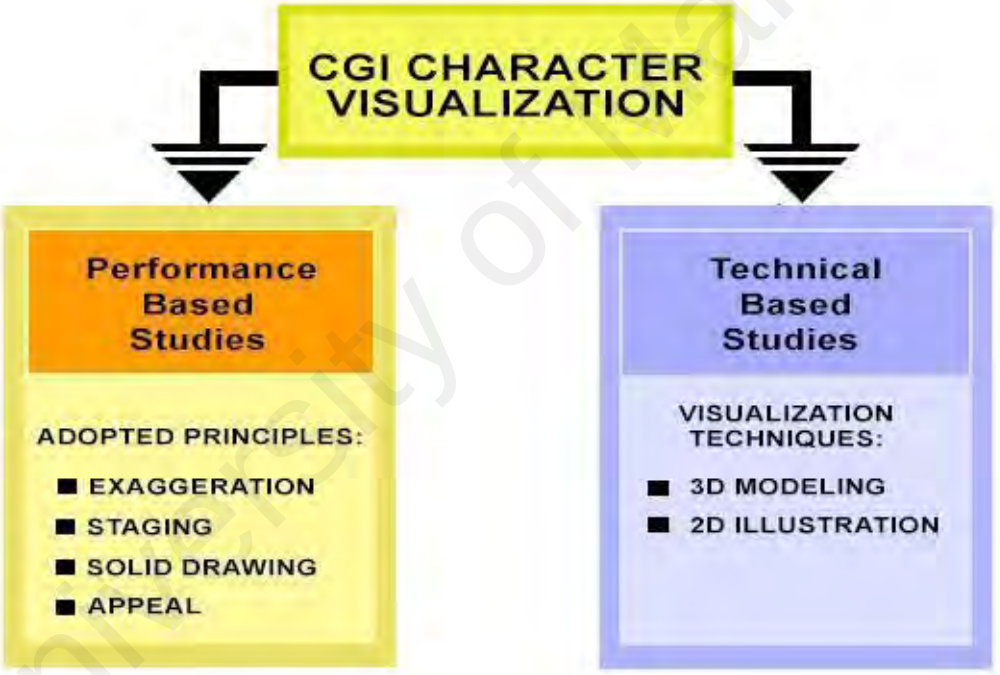

Figure 1.6: Performance and technical based studies in CGI character visualization.

1.8 Theoretical framework

Figure 1.6 described two aspects of studies, **performance and technical based studies** were commonly involved in the studies of CGI character visualization. However, it is important to be highlighted here that the researcher would only explored the **performance based studies**. In **performance based studies**, the adoption of relavant

principles **(Exaggeration, Staging, Solid drawing and Appeal)** from classical principles of animation could not be avoided. They are considered the most useful criteria to be analyzed through by evaluating the expressive quality of CGI character.

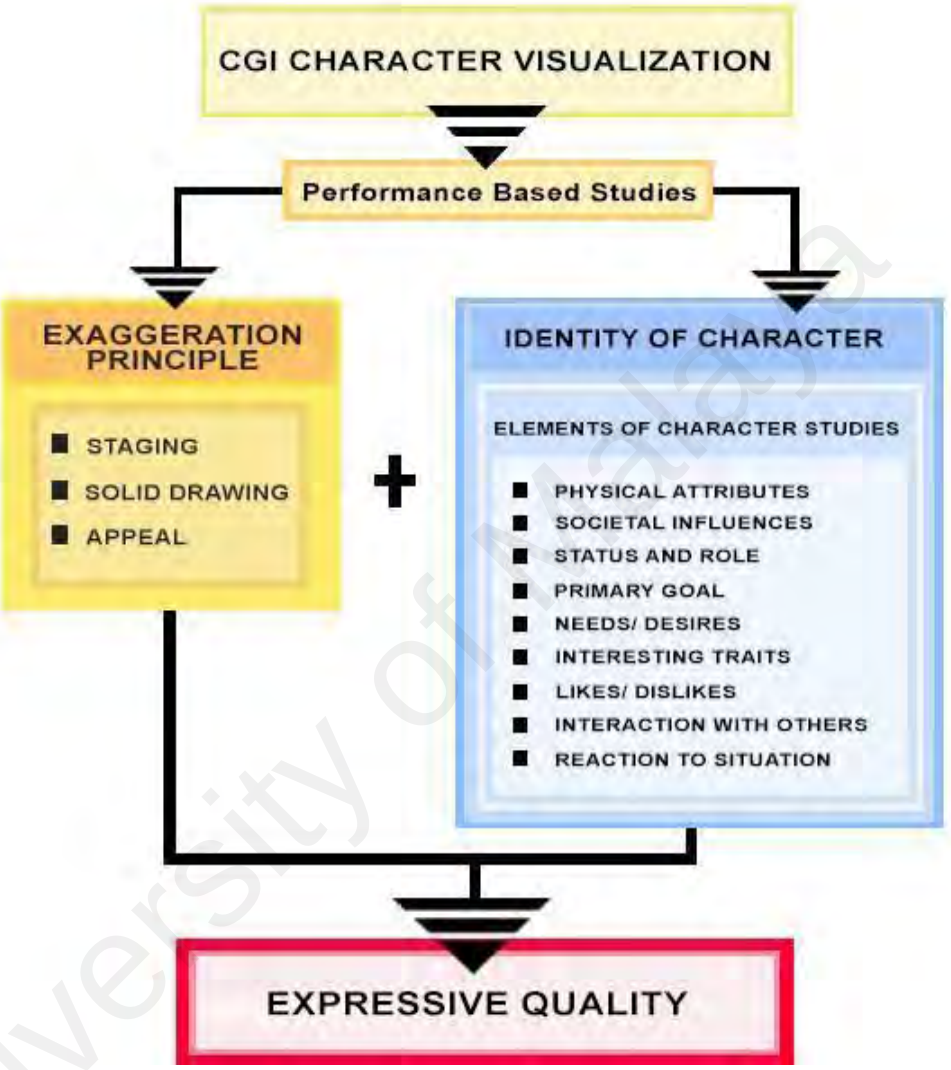

Figure 1.7: Theoretical framework of the research phenomenon

As shown in Figure 1.7, the theoretical framework described how the **performance based studies** were conducted. The studies consisted the exploration to the role of **exaggeration principle,** which adopted from classical twelve principles of animation. In CGI character visualization, the **exaggeration principle** was implemented into **character designing process of 3D model**. Within this area of research, the researcher would adopt the other related components from the classical animation principles. As such **appeal**,

solid drawing and **staging** became the principles that to be analyzed while judging the exaggerated features of CGI character design. On the other hand, this research was also required to study some identity of Iban warrior, Panglima Bukit Sadok character. While implementing the exaggeration principle, the researcher would have to consider to understand some elements of character that gives the identity to Panglima Bukit Sadok. Through this process, the **exaggeration principle** was expected to present more **expressive quality** in bringing the character alive and as well as reflecting a clearer essence of **Panglima Bukit Sadok's personality**. **Expressive quality** in this research is meant to feature a stylized CGI character that truly based on the essence of real life historical figure.

In the early days of Disney studio, the call for solutions to develop a more emotional form of animated characters resulted in the development of twelve fundamental principles of animation, which Frank Thomas and Ollie Johnston (1995, p.47) noted that they were taught to new animators in such a way that they were visualized to be the new rule of the animation trade. These twelve principles of animation which has been described by Frank Thomas and Ollie Johnston (1995, p.47) include:

1. **Squash and stretch** – a change in shape which is made to place more emphasis on weight and volume.
2. **Anticipation** – a movement meant to precede the major action.
3. **Staging** – this is the presentation of action in such a way that it can be clearly communicated to the intended audience.
4. **Straight ahead action and pose to pose** – this is the working method used in the creation of animation.
5. **Follow through and overlapping action** – all the objectives are not forced into a complete stop at the same period of time. Some objectives are

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developed to lead while other follow the leading object.

6. **Slow in and slow out** – this is used to reference the controlling of spacing of images developed to enhance how objective speeding up and slowing down appear.
7. **Arcs** – natural movement normally travel through the space via an arc.
8. **Secondary actions** – this is an action used to support the main action.
9. **Timing** – this is used to give meaning and texture to the movement of animated characters.
10. **Exaggeration** – this is a caricature of actions that are used for punctuating and emphasizing motion.
11. **Solid drawing** – these are the kinds of drawings made in such a way that they appear to have volume and depth.
12. **Appeal** – the design and motions of characters are developed in such a way that they appeal to the audience.

With the constant research and development, animation has eventually developed to the level at which principles have now become so refined in such a way that it is progressively becoming very difficult for animators to actually identity one another. In any case, those animation companies besides the Disney studio such as the Warner Brothers (WB) and Metro-Goldwyn-Mayer (MGM) has increased started applying the principles in such a way that it is being used as a vivid display of broad characters' actions as a result of trained animators from Disney moving to other studios where they are given necessary opportunity and freedom to experiment with difference styles of movement which do not confirm with the ideology set by the Disney world. Other studios like the PIXAR has extended the legacy set by Disney, while other studios such as the Dreamworks and Bluesky has reverted to using broader and even more liberal forms of application of such principles which are more aligned with the WB and MGM vocabulary

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of movements. Other animators such as John Kricfalusi (2008), has even expanded their discussion and views on the animation subject by suggesting that WB and MGM have been successful in developing a style of animation that seems to have a better application of the initial discoveries made by Disney animators. No matter where the argument extends to, it is evidently clear that principles developed by Disney studio still remain the basics of the animation practices through the creation of the illusion of motion and expanded credibility of characters that are used in the animation industry.

Furthermore, arguments can be made that the case discussed above still remains in relation to the relatively new medium of computer generated (CG) 3D animations. In a seminar paper with the title: *Principles of Traditional Animation Applied to 3D Computer Animation,* John Lasseter (1987) made the argument that in order to understand the principles adopted in traditional animation, it is very important to produce an effective 3D animation, and that irrespective of the medium adopted, the application some of these principles do still remain the same. Following the presentation of his first 3D CG animated short film, *Adventures of Andre and Wally B (1985),* Lasseter addressed the question asked to explain which software that was used in the creation of such "believable character", and the animator responded with the explanation that it is not a matter of the software because it wasn't the software that "gave life" to the characters animated, but it was the principles that has been learned and applied as a traditional animator at the Disney studio that produce such a stunning transformational character. The animator further went on to explain that it was not that software that gave the life to characters, instead it was these principles of animation, which is the trade tricks that the animators have developed over the course of 50 years (Lasseter 2001). In accordance with Lasseter, traditional animations are developed to provide series of tricks which the animator can apply in the process of creating highly credible animation, and this should be more or less similar with such animation process are transferred into the computers.

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In any case, one specific note needs to be understood that Lasseter did say that the way in which squash and stretch, slow in and slow out, arcs, appeal straight had and pose-to-pose applications are made must change as a result of differences existing in the medium (Lasseter 1987). Vivid explanation to such views are presented at PIXAR animation Studio. The animators made use of tricks, both old and new, in order to get what they desired to appear on the screen. This means that the combination of old and new tricks has been the main success factors behind making PIXAR animations (Figure 1.8) very much convincing.

Figure 1.8: Character designs from PIXAR Animation Studio.

The significant advancements have been made on technology of animation was written in the paper presented by John Lasseter in 1987. Since then, the technical of computer animation has not only upgraded within its field but also influenced the developments made by other fields as well by enhancing standard of understanding towards the principles. For instances, fields like acting, photography, live-action films and the science of biology have all continued to develop new theories, principles and languages that continue to shape the animation industry. On that accord, Kerlow (2009, p.305) made the arguments that the universal challenge now faced by animators is to reintegrate and expand the foundational animation principles and also to add new

principles that will be used to address the modern and present styles, techniques and possibilities in animation.

In recognition of the established link between traditional principles of animation and the past crafts and forms of expression, Kerlow has made a clustered view of the animation principles around "telling a story, acting of directing a performance, representing the reality, the actual process of crafting or representing or creating some level of credibility in the animation process, and editing the sequence of actions (Kerlow 2009, p.305). As such, Kerlow has offered six added principles in the animation process and they include:

1. Limited animation;
2. Cinematography;
3. Facial animation;
4. Visual styling;
5. Motion blending; and
6. User-controlled animation.

In any case, it is important to understand that in their full details, these added principles see to be mainly based on the different forms, styles, and application of animation, and they are not completely new principles as they are generally perceived to be, instead they are the re-interpretation of expanded understanding of the basic principles developed in the early days of Disney studio. For instance, the case of cinematography is based on the basic principle of Staging which was further extended to suit the current entertainment trend of application and it is not a completely new form of principle as what it has been claimed. Additionally, the entertainment industry has witnessed limited animation since the short time following the basic principles developed by Disney and while limited movement are very basic within this particular animation style, it is also

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important to note that the fundamental principles still prevail.

By looking at some extended development from the original twelve principles, four important production elements used in animated feature film-making where also used by Disney as the established guiding principles and they include:

1. **Character development** – this involves the process of giving characters their personality in the animation industry.
2. **Story** – stories are generally crafted to be well planned, well placed and interesting.
3. **Acting and emotions** – this involves visualizing characters in the form of real actors in order to attach well established and common emotion to the scenes.
4. **Expression and dialogue** – the feelings of characters used in this section must be expressed with the aid of animation and dialogue.

From the above theoretical knowledge, it is to explain that relevant principles and process of animation would keep on developing according to the era of application trend, which further linked to the area of CGI character visualization. Moving along the study of this theoretical knowledge, the researcher took it as a starting point to connect to the scope of study. The further discussion will be presented in preceding chapters.

1.9 Work flow of research

Figure 1.9: Work flow of research

The effective planning is necessarily needed in order to deliver success in researches. This is because it will provide the researcher with a clear understanding what is required

in the research process as well as conducting the overall research objective. This research has no difference as this section will seek to expand an understanding on what will be done and how it will be done.

The research starts with the first chapter with the overview introductory of research. The purpose of this research is to highlight what will be done in the form of research objectives and how it will be done in the form of research questions that the whole research will seek to address. Additionally, overall background analysis is also developed in this section to give readers a glimpse and simplified understanding of what the research topic is all about.

The second chapter is a review of literatures which relevant to the research topic. This review will look into the application of CGI in character creation development and understand the success and failure of CGI character creation in which the past experiences are accounted for, which led to the adoption of twelve animation principles. Of course, the emphasis was to review the main understanding of Exaggeration principle application from the few existing literatures in order to seek for potential development in the process of CGI character visualization. This chapter will also define necessary variables in the area of the research topic.

The third chapter is the research methodology. It is the breakdown of how the whole research process will be conducted in terms of the primary research design. In this section, the variables that will be loaded into the primary research will be brought into full focus by making them easier to understand and also discussing the purpose for loading such variables. Additionally, this section will also look into discussing the approach for research analysis.

The fourth and final chapters are research analysis, discussion and findings and conclusion. The focus of the result is to present detailed analysis of findings from the whole research process. In this chapter, findings will be individually analyzed in

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accordance with their level of correlation with existing understandings and their influence on future related applications. This is followed by the conclusion, which is a comprehensive analysis of findings from both the secondary and primary research, recommendations on application of findings and recommendations for future research.

Definition of Terms

Classical animation principles: these principles represent the rules of practice in animation that have been deployed since the beginning days of animation, that is to say the pre-computer periods. They form a set of guidelines that animators need to follow in order to gain necessary assistance on producing the most effectively possible animation. Based on the description offered by Thomas and Ollie Johnston (1981), who was opportune to work with Disney Studio in the early 30s and also took part in the development of the animation principles, twelve principles represent the traditional animation principles. These principles define the four major production elements in animation in the form of: development of character, story, acting and emotions, and expression and dialogue (Thomas and Johnston, 1981). Their definitions are still widely acknowledged and adhered to by modern animators including Richard Williams, who is the award-wining director of *Who Framed Roger Rabbit (1988) (*Williams, 2002). Another acknowledgement mad by Williams is that there is a relationship between the four production elements and the actual animation principles. Recognizing such studies, this research does include both the four production elements and 12 animation principles in this study for further investigation.

The traditional animation principles have been hopeful in the transformation of animation form just a novelty into a form of art. Through the application of these principles in their respective works, many of the world's pioneering animators did successfully produce the numerous earliest animated feature films that became classics

such as: Snow White in 1937 and Pinocchio in 1940. What the animation principles points at is the rules of physics and motion, which is used to dictate the movement of people and objects from space as well as how people react to physical forces. The principles also incorporate numerous acting some psychological theories that are built around human behavior which guides the way animators make use of facial expression, gestures, and postures in their development of animated characters (Thomas and Johnston, 1981). Thus, this study will also focus on the 12 animation principles and four production elements in the course of the study.

Computer Generated Imagery (CGI): this is normally referred to as 3D computer graphic, and this is the form of visualization that is entire produced with the aid of computer by making used of 3D animation software. A good example of such is the *Toy Story* produced by PIXAR in 1995 (Furniss, 1998). The CGI animation process involves the creation of characters and objects through the method of constructed polygonal or NURBS meshes, which are developed through the form of virtual bones before being inserted into the mesh to make the animated object. The articulation process is the facilitated by the rotation of these bones, or through the movement of controllers that have links with the bones. This system of bones and controls is referred to as a "rig", and the CGI animator takes advantage of such benefits by manipulating it into different positions or what is referred to ad poses. Inserting poses at different times over an allotted period will result to the movements between the poses which are automatically animated with the aid of the software (Clark, 2002).

2D traditional animation: this is a process for producing animation and it has dominated the animation method right from the early days of the animation. Before computers were introduced in the animation industry, this method was built around drawing the animation on paper and photocopying or tracing the drawn object into a transparent celluloid (cel),

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which will be then painted. Each of the traced cel will be then photographed with the aid of rostrum camera. Majority of the animations that were aired in films and TVs shows in the mid-90s were all produced with the aid of 2d traditional animation. In the modern setting, although traditional animations are still hand-drawn on paper, they are scanned into computer programs before being inked and painted digitally. The individual frames of animation directly rendered from the software, which removes the need to individually photography each cel. The *Lion King* by Disney in 1994 is a good example of modern 2D animation.

Exaggeration Principle: refers to a rule of action that used in animation to remain true to reality, just presenting it in a wilder, more extreme. (Thomas & Johnston, 1981).

Character animation: refers to a specialized area of the animation process, which involves bringing animated characters to life.

Stylizing: refers to an act of making a conform to characteristics or elements combined and expressed in a particular unique feature with consistent manner.

Expressive: refers to the contents of inner experience rather than solely realistic portrayal, seeking to depict not objective reality but the subjective emotions and responses that objects and events arouse in them.

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CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This literature review seeks for the understanding of theories that surrounds the research topic in order to create a better background for fulfilling the aim of this research and achieving research objectives. This chapter shall begin with the contextualization of CGI application in character visualization before continuing to discuss the hypothetical theories that could be related to this research topic.

One of the main studies in the literature review is to understand the **uncanny valley** theory which is believed to determine the failure and the success of CGI character visualization. This key hypothetical theory leads the researcher to the in-depth discussion of problematic factors that could be detected in the highly realistic CG character if it falls under the uncanny valley. The main factor that affected by the uncanny valley is believed to be the **empathy**. This discussion is to be focused by the fact that the character falls under the uncanny valley is hardly be able to connect the empathy effect with the viewer.

Therefore, the concept of **empathy** in the context of CG character visualization is to be understood to approach the understanding of **appeal** and **interest**. The further discussion would be explored on **the adoption of classical principles of animation in CGI Character Visualization**. This section would be focused on **Exaggeration principle** which adopted as a key principle for the conceptual framework in this research. Within this area of research, the researcher would discuss the other adopted components from the classical animation principles as well. As such **Appeal**, **Solid drawing** and **Staging** became the principles that to be analyzed while judging the exaggerated features of CGI character creation.

2.2 The application of CGI in character visualization

Computer-generated Imagery (CGI) is the application of computer graphics to

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generate visuals for various media such as print based media, video games, films, television, web media and virtual simulator. The final visual output may be dynamic or statics. CGI may be either in the form of two dimensional or three dimensional, though the term "CGI" itself may commonly refer to three-dimensional computer graphics used for producing synthetic scenes, from special effects in the film industry to virtual reality and video games. Many of these synthetic scenes involve CG characters. Recent CGI technology have already proven that the 3D software able to simulate human characters with highly realistic quality. 3D modeling software, for example, Maya (Autodesk, 2010b), does not only provide the advance modeling tools for shaping the objects, but also supply the advanced rendering techniques for artist to build the very realistic character with vivid texture and lighting. Moreover, even an individual without any drawing skills, can use most of the current 3D modeling software (Autodesk, 2010b) to model the objects, characters, and landscapes (Rowley, 2005).

'Realism and naturalism, ideas of art as an imitation of reality, are currently the primary ethos of 3D animation culture and technology' (Power, 2009). In fact, this is true opinion that the development of CGI character visualization is associated with the advancements of computer technology to imitate reality. Today's technology allows CGI artists to create highly detailed CGI characters with all the complexity of features, as to achieve the likeness of real life beings. The current computer graphics software often provides a group of functionality and library, such as hair, skin, clothes animation, skeleton animation in order to simplify artists' work and achieve more realistic results (Rowley, 2005).

As seen, in film such as *The Final Fantasy: The spirits within* (Sakaguchi and Sakakibara, 2001), the film industry seeks to create images of human beings that are indistinguishable from reality. At one point, the achievement of current technology has brought more solution to CG artists in tackling the technical problems that previously

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might be considered as complex, but at another point, it has also been a challenging path for CG character creation. As more possibilities could be done with the latest technical approaches, the expectation of viewers towards the CG character output quality would be getting much higher. Therefore, the tasks of CG character artists are becoming tougher when their main goal is to approach photorealistic perfection. The difficulty of character photorealism has been attributed to the uncanny valley (*bukimi no tani* in Japanese). The term derives from a hypothetical theory proposed in 1970 by Masahiro Mori. In the following section the theory of Uncanny Valley will be discussed.

2.3 The Uncanny Valley Theory

A theory called the Uncanny Valley has been used as the universal term to describe the phenomenon that concern about the appearance of a character which gives negative or positive reactions to viewers (Mori 1970). This phenomenon was originally hypothesized by a Japanese robotic expert, Masahiro Mori (1970) which meant to refer to robotic field. Mori stated that when a robot looks more human it would give more familiarity to viewers, until it appears to be so human-like that the viewers start to find its nonhuman imperfections unsettling. The observation leads Mori to the belief that robot builders should not attempt to make their creations overly life-like in appearance and motion. It stated that the closer a robot comes to resembling a human being in its motion and appearance, the more positive our emotional response to that object becomes until suddenly, at some point of very close resemblance, viewers' emotional response turns from empathy to revulsion. Mori said that this revulsion or uneasiness is the result of a basic human tendency to look for anomalies in the appearance of other human beings. He also hypothesized similar effect to the feeling that viewers have when they watch a zombie movie or see an actual corpse. In both cases, what viewers see is both human and not fully human, and the contradiction produces a very negative reaction.

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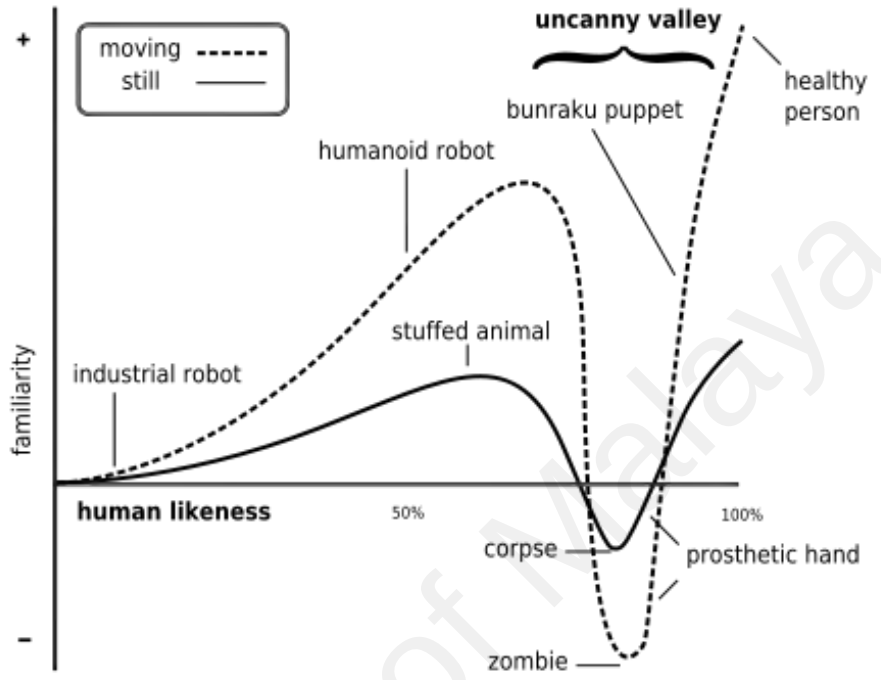

Figure 2.1: The theory of the Uncanny Valley.
(MacDorman, 2005)

The theory of uncanny valley as figure 2.1 has been adopted into the entertainment industry, particularly in CGI animation field when creativity judgment of character design always become the common discussion issues among CG artists. The first major film to use CGI to represent a realistic human was the film *Final Fantasy: The Spirits Within* (Sakaguchi and Sakakibara, 2001). It seemed inevitable that this film would fall into what CG artists call “The Uncanny Valley", that is, the characters would closely resemble real human, until they appear so human that viewers begin to find subtle imperfections unsettling. The theory while created for robotics is now synonymous with 3D computer graphics. The issues are often could be read in trade journals and the popular press because of the uncanny valley’s perceived impact on the multi-billion-dollar animation and video game industries (Gouskos, 2006; MacMillan, 2007). The uncanny valley has even taken

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as a guideline for the studios like Pixar to avoid realistic character, choosing instead cartoony stylization (e.g., the characters of *The Incredibles*; Canemaker, 2004).

In 2004, an interesting comparison involving the Uncanny Valley arose when two blockbuster CGI films were released within a couple of weeks of each other. One being Pixar's *The Incredibles* (Bird, 2004) and the other being Warner Brothers' *The Polar Express* (Zemeckis. 2004) as figure 2.2 below. While *The Incredibles* used stylized and exaggerated characters, *The Polar Express* used sophisticated motion capture techniques (Oddey & White, 2009. p.34) and attempted to closely imitate reality. *The Incredibles* seemed to be more successful with both critics and audiences gaining huge box office success; nearly double the business of *The Polar Express* (Time Inc, 2010). Many critics talked of how *The Polar Express* had fallen into the *Uncanny Valley*.

Alison Oddey and Christine White in the book *Modes of Spectating* describe an 'emotional warmth' that was felt for Pixar's 'stylized, plastic family' in comparison to 'unforgettable feelings about the more accurate yet eerie characters in *The Polar Express'* (2009, p.33) The BBC's Stella Papamichael reviews that 'kids will run screaming from *The Polar Express* after seeing Tom Hanks looking like he's been killed, embalmed and resurrected by lightning' (Oddey & White, 2009. p.34). During the research of this theory, many reviews had shared similar opinions to these. The fact that viewers and critics seemed to prefer the stylized characters, over the more realistic, highlights the importance of exaggeration in character design. Viewers connect with an exaggerated caricature in a much stronger and more positive way than with an attempted portrayal of reality.

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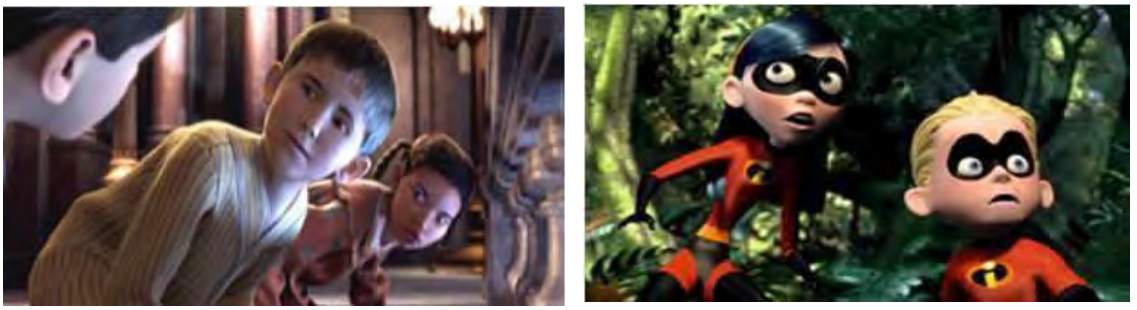

Figure 2.2: Comparison between the character designs of *The Polar Express (*left) (Zemekis, 2004) and *The Incredibles* (right) (Bird, 2004)

Based on uncanny valley theory, there have been mixed responses from viewers to highly realistic characters used in movies, with some saying that the increased realism highlights subtle imperfections, which can be disturbing. For example, the CG character of Davy Jones looked so human in *Pirates of the Caribbean: At World's end* film as figure 2.3, critics assumed he was portrayed by an actor wearing prosthetic tentacles (Zacharek, 2007). The critics did not realize the actor, Bill Nighy, had been entirely replaced by CGI. However, this CG Davy Jones was believable, because he was meant to look supernatural and creepy. The same principle applies to other CG character, such as Gollum in *The Lord of the Rings*. By contrast, characters designed to look like real people have been less convincing, such as the CG heroes in *The Polar Express* and *Final Fantasy: The Spirits Within* (Geller, 2008; Pollick, in press). Thus, depicting convincing and believable CG characters remains to be a difficult task.

The reasons why people like the appearance of a particular CG character may be influenced by many psychological factors, such as the familiarity of the characters to the observers (Dill et al. 2012), the possible adaptation of the society to cartoon faces (Chen et al. 2010), the viewers' level of expertise in computer graphics (Fan et al. 2012], or their increasing ability to notice the tricks and techniques employed (Tinwell and Grimshaw 2009). In this context, it is generally accepted that stylized versions are often preferred over realism [Geller 2008], but the reasons for this are still unclear.

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Figure 2.3*:* The CG character of Davy Jones in the film*, Pirates of the Caribbean*

Figure 2.4*:* The CG character of Gollum in the film*, Lord of the ring*

2.4 The Adoption of Classical Principles of Animation in CGI Character Visualization

In 1981 Disney animators, Frank Thomas and Ollie Johnston released the book *Disney Animation: The Illusion of Life*, now considered by many as the most influential book to be published in animation history. This book provides a valuable resource specifically for anyone concerned with animation. It seeks to explain the process and techniques of animation that makes Disney's animation uique. One of significant success in this book is to introduce twelve animation principles which covered the resource that very much relevant to this research topic.

In the book *Disney Animation: The Illusion of Life*, *the Chapter 3: Principles of animation*, is a good introductory reading to animation. The twelve principles are discussed in this chapter. In contrast with the technical based studies, the performance based studies that to be focused are mainly concerned with the expression of a behavior in character. The emphasis is not on the functionality of the character in technical aspect, but on how audiences perceive the behavior of the character. The underlying idea of conveying messages through expressive behavior is borrowed from the field of this classical animations. The most cited set of principles are the twelve principles of Disney Animation by Frank Thomas and Ollie Johnson listed in Table 2. 1.

Table 2.1: Twelve principles of Disney animations by Thomas and Johnson

1. Squash and Stretch	7. Arc
2. Anticipation	8. Secondary action
3. Staging	9. Timing
4. Straight Ahead Action and Pose to Pose	10. Exaggeration
5. Follow Through and Overlapping action	11. Solid Drawing/Solid Design
6.Slow in and Slow out	12. Appeal

2.5 Exaggeration Principle

When discussing the meaning of exaggeration in the context of character design, the word **caricature** commonly would be mentioned alongside exaggeration. **Caricature** gives emphasis to the certain aspect of reality, which considers to be the most important for artists or animators (Hooks, 2003. p.101). The word caricature is said to be derived from 'the Italian or French word, *caricatura,* meaning satirical picture, literally an overloading; or *caricare*, to loads, to exaggerate, greatly distort'. When applying this definition to animation, exaggeration is to be used to “extract every bit of personality or action from a gesture that will best portray your character's special traits” (Stanchfield,

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2009. p.119). Another words to say, exaggeration stands as an important principle that use to distil the very essence of an action, force or emotion, in order to communicate it clearly to the audience.

Pablo Picasso once said that, *'Art is a lie that enables us to realize the truth'* (Marmor & Ravin, 1997). His statement is not only meant to describe his own philosophy towards the role of art during his time but yet it is still relevant for today's art application. In CGI character visualization, attempted realism that CG artists try to achieve is not meant to be totally imitation of reality but it is to exaggerate the essence of real personality and express it to the audience in clearer and understandable way. Disney has created some of the most widely accepted characters which are mostly attempted to be in stylized or exaggerated forms.

There was some confusion among the animators and artists when Walt Disney asked for more realism in character creation and then criticized the result because it was not exaggerated enough. In fact, when Walt [Disney] asked for realism, he is actually wanted a caricature of realism (Thomas & Johnston). In Walt's mind, it is believed that he suggests animators or artists must be going to the heart of anything and developing the essence of what they found. (Lasseter, 1987. Pg.41). It seems that reality in character isn't realistic at all, it is reality exaggerated. A character is meant to be exaggerated in the creation for certain reason and importantly, it should be well understood by its audience.

A character in any animated movie works as an actor on stage, should convey its emotions to every member of the audience (Hedgpeth & Missal, 2003. p.201). Walt Stanchfield, who conducted gesture drawing classes at the Disney studio in the 1980's, teaches that animators can think of themselves as **pantomimists**. A successful **pantomimist** will use exaggeration in his anticipations, attitudes, expressions and movements to convey the emotion to the audience in a simple yet effective way (2009. p.192) and should leave no uncertainty in the mind of audience about the mental state of

the character' (Stanchfield, 2009. p.77). In order to achieve this, animators or artists can use exaggeration to choose exactly what emotions they want to convey to the audience clearly and precisely.

2.6 The relationship of exaggeration principle with other principles

Exaggeration was adopted as a principle in various publications and papers concerning the relevant subject. **John Lasseter**, director of *Toy Story* among others (Pixar, 2010), explains that a scene has many components, including design, action and emotion, and exaggeration can be applied to any of these components, but not in isolation (1987, p.41). The further detailed discussion was brought up in the book (Thomas & Johnston, 1995) to describe the importance of exaggeration principle to character pose and emotion, the power of a pose is such that, as **Charlie Chaplin** once argued, ' *if an actor knew his emotion thoroughly, he could show it in silhouette'* (Thomas & Johnston, 1995. p.56), stating that body language can say a significant amount more about the emotional state of a character than in fact the dialogue can. (Hooks, 2003. p.55). The expression of a character therefore needs to be 'captured throughout the whole body as well as in the face' (Thomas & Johnston, 1995. p.443) and exaggeration is an important component in the construction of body language and pose. In this matter, **staging principle** has been taken into account. Thomas and Johnson stated that **staging principle** is to be considered as the presentation of idea in such a way that it can be clearly communicated to the intended audience. The iconic body languages, gestures or poses are staged, so that the certain identical behavior of the character is understood well. The unique personality is staged so that the character is recognizable to audience. Apart from it, the mood is staged to affect the emotion of the audience.

In this chapter also, the animators, Frank Thomas and Ollie Johnston summarize brilliantly their attitude to applying exaggeration; *'If a character was to be sad, make him*

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sadder; bright, make him brighter; worried, more worried; wild, make him wilder' (1995. p.65). In common, the principle of **Squash and Stretch** is the process of changing the shape of an object to give 'the audience a visual representation of the forces impacting it' and is one of the 'keystones of good animation' (Albee, 2004. p.241).

In the example of a bouncing ball, the force of gravity affecting the object is identified and exaggerated through the use squash and stretch applied as the ball makes contact with the floor and when it's not at its peak. When forces are exaggerated they can give a much larger and more entertaining impact on the audience. In fact, the extreme changes to the volume of the character must be done with precaution by based on the forces of reality. When volume of character is adjusted to quite an extreme, it is important to ensure that the drawings of the character managed to portray the illusion of **weight** and **mass** to the audience (Lasseter, 1987. p.42).

In this case, Frank Thomas and Ollie Johnston recommended **Solid drawing** as a principle that basically refers to drawings that have an understanding of their placement within 3D space by taking into account of **mass** and **weight**. In 3D computer animation particularly, a perspective or angle of the characters could be done easily by today's 3D software. The following principle that Frank Thomas and Ollie Johnston also discussed is **appeal** which considered as one of the most important principles for character design study. (Thomas and Johnston, 1995). John Lasseter states that the word **appeal** is often misunderstood to suggest 'cuddly bunnies and soft kittens. It doesn't; it means anything that a person likes to see: a quality of charm, pleasing design, simplicity, communication, or magnetism' (Lasseter, 1987). Lasseter goes on to state, that poor design lacks appeal. 'A design that is complicated or hard to read lacks appeal. Clumsy shapes and awkward moves all have low appeal'. While the Disney animators discussed a number of key points that in essence seem clear but when applied to the level of detail that can be obtained from 3D computer animation we inherently find a problem.

As mentioned in chapter 1, this research gives emphasis to the role of **exaggeration**

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principle, which adopted from classical twelve principles of animation. In CGI character visualization, the **exaggeration principle** was implemented into CGI character design. Within this area of research, the researcher would adopt only the related components from the classical animation principles. In fact, the researcher has identified **three relevant principles** that very much useful for the study of CGI character design. As such **appeal**, **solid drawing** and **staging** which described earlier became the principles that to be analyzed while judging the exaggerated features of CGI character design. In the following section, the study would be given focus on the exaggeration principle by defining its meaning and important roles in the context of character design.

2.7 The believability in Character

The definition of believability has been studied by researchers in many contexts (Andrews, Netemeyer, & Durvasula, 1991; Beltramini, 1982; Berkos, 2003; Ewing, 1940; Hovland, Janis, & Kelley, 1953). However, the definition of the term Believability has been made differently based on the context of the study. The Believability of characters in CGI visualization, for example, is not necessarily related to truthfulness or credibility (Mateas, 1997). Characters are "*artistic abstractions* of people, whose behavior, mot ivations, and internal life have been simplified and exaggerated in just such a way as to engage the audience in the artist's vision" (Mateas, 2002, p. 8).

Recently, Lee and Heeter (2008) studied the definition and quality of the believability throughout many animation literatures and examined it with many theories in both the social science and communication area. Based on their research, they defined believability as 'the size and nature of the cognitive gap between the audience experience and the character they expect'. When the audience's expectations match their experience, a character is fully believable. The larger the gap, the more likely it is to interfere with suspension of disbelief."

The concept of believability was first described and used by traditional cartoon

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animators who speculated about how they achieved the believability in the characters they drew. Charles M. Jones, a master of animation, who directed many Warner Brothers animated characters, such as Bugs Bunny, Daffy Duck, Elmer Fudd and Porky Pig, stressed the importance of believability in animated character design bringing a character to life (1989). Animators at Disney have tried to illustrate their characters as living entities that can think and act by their own volition to create the illusion of life (Thomas and Johnson, 1981). The goal of these early animators was to create the illusion of life, facilitating viewers' willing suspension of disbelief. Computer scientists and artificial intelligence researchers might borrow the practices of these early animators to make CG characters more believable (see Bates, 1994).

The Lee and Heeter's analysis of believability qualities produced 5 key believability categories: appearance, personality, goals, emotions, and social relations. Each of these qualities is expected to contribute to overall general believability. Certain qualities may be more important to general perceived believability than others.

1. Appearance

Computer scientist Hayes-Roth and colleagues described the appearance of an CG character as "the encoding of each characters' identifying demographic information – age, weight, gender, socioeconomic background and culture in the chosen embodiment of the character, as well as the representation of this embodiment" (Hayes-Roth et al., 2002). When people look at a character, they make guesses on not only what kind of character it is but also how the character would interact with certain condition based on context and the information perceived by sensory input.

According to the definition, appearance not only includes static, visible attributes, but also animated gestures and nonverbal behaviors (e.g. Hayes- Roth and Doyle, 1998). It is critical to design the appearance of computer characters based on their roles in the context where they are. Quality in the appearance category is usually perceived first, and

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audience establish a kind of expectation based on the information from it. Even in a case where there are only limited amounts of visual information. Audience are capable of constructing a kind of an image of the character based on the available information. Hayes-Roth, Maldonado, and Moraes confirmed the importance of appearance in character design by saying that it affects the character's effectiveness and credibility at performing its assigned role, and directs the patterns of interaction. Even before the character does any action, the audience has already processed the subliminal cues embedded in the character's representation, such as the relative status and occupation of character in the story. (2002)

In appearance, whether to create a monkey, robot or monster, it is guarantee to say that there are going to be a hundred other similar creations out there. The character needs to be strong and interesting in a visual sense to get people's attention.

2. Personality

Personality has been one of the most important aspects of believability for cartoon animators. Thomas and Johnson (1981) described importance of the personality as "For a character to be that real, he must have a personality, and, preferably, an interesting one".

Personality defines the uniqueness and peculiar qualities of CG characters that distinguish them from other CG characters. Some qualities of personality are closely related to the psychological traits.

Computer scientist, Loyall (1997) defined personality as "all of the particular details especially details of behavior, thought and emotion that together define the individual".

Mateas, a researcher, defined personality as the thing that inspired every single behavior of a character from very simple behavior, such as talking, to very cognitive activity, such as reasoning (1997). To him, personality is "something unique and specific" (1997). Mateas discussed other qualities of believability, such as emotion

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and change, but he argues they must be consistent with the personality of the character.

Pixar Animation Studio revealed that interesting looks of character alone do not necessarily make for a good character; its personality is key as well. A character's personality can be revealed through animations, where audiences see how it reacts to certain situations. The personality of your character doesn't have to be particularly agreeable, but it does need to be interesting (unless your characters is purposely dull).

3. Goals

Goals are one of the most important fundamentals for creating believable characters because goals directly affect all other qualities of believability. (Appearance, personality, emotion and social relation). Character intentionality (goal) is "…the way in which the choice of actions and behaviors that a character makes appears natural (and possibly rational) to external observers" (Riedl and Young, 2005).

The driving force behind a character's personality is what it wants to achieve. (goals) Often, the incompleteness or flaws in a character are what make it interesting. (Pixar, 2013)

The classical animators knew expressing the thinking process of cartoon characters was important, but they didn't know how to reveal it. According to Thomas and Johnston (1981), it was the animation of a dog that looked into the camera and snorted that gave them the idea of making cartoon characters appear to think.

4. **Emotions**

Emotion is one of the two most important qualities of believable character (Bates, et al., 1994; Hayes-Roth & Doyle, 1998; Hayes-Roth, Maldonado, & Moraes, 2002; Loyall, 1997; Reilly & Bates, 1995; Romano & Wong, 2004).

The emotion category doesn't prescribe what kinds of emotions believable characters have to possess. Rather, all of the research literature about emotions suggests that it is important for believable characters to clearly exhibit emotions of their own. The

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emotion category requires believable characters to reveal their emotions as an outcome of unseen internal processes. A believable character might be temporary revealing a certain emotional state which perhaps affect its common behavior in a certain situation or condition.

A particular character's emotion needs to be clear enough that audience can distinguish each emotion at a glance. The expression of a character's emotional state should be neither ambiguous in meanings nor weak in strength.

Emotional states should be revealed through multiple channels such as facial expression, gestures, etc. In some cases, for example, it may be hard to notice emotions only by looking at the facial expression of a character either because the face is too small or the face may be looking away. Body language sometimes can be helpful in conveying character emotion.

Expressions of character shows a character's range of emotions and depicting its ups and downs will further flesh out the character. Depending on its personality, a figure's emotions might be muted and wry or explosive and wildly exaggerated. (Pixar, 2013)

5. Social relations

It should be insisted that social relations among characters should be designed carefully with detailed behaviors and interactions to reveal the relationships among characters (Loyall, 1997)

A character that appears to have a social relationship with other characters helps audience willingly suspend their disbelief and conceive of the character as real. The social relationship between a CG character and the audience can also affect the perception of believability. Nass et al. find that audiences feel more attraction and trust with a CG character that has the same ethnic background as the audiences than with one that has a different ethnic background (2000). The more audiences feel a social connection with the CG characters, the more believable the character will seem.

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The world in which the character lives and interacts should in some way make sense to who the character is and what it gets up to. (Pixar, 2013)

2.8 Expressive quality in CGI character visualization

The concept of *expressive* is ubiquitous in the arts, but 'few terms are as poorly understood' (Robinson, 2005: 231).4 the common use of *expressive*, as in gesture/facial expression, points to emotion as underpinning expression. The expression theory of art typically claim that art should be viewed as the expression of the mind of the artists to convey their emotions, feelings and thoughts. Expressive qualities of artworks are ultimately 'qualities that can be grasped through the emotions they arouse' (Robinson, 2005: 291–2). Oxford professor of English, Christopher Butler (2004), writing of emotions and the arts, observes that:

> *'Ultimately it is these emotional responses which count for our pleasure or pain; it is our emotions and moods, apart from physical pain, that contribute most to our sense of the happiness, and the sadness of our lives.'*
> (p. 36)

Expressive arts need to be experienced emotionally if they are to be properly understood. Butler (2004) sees understanding and emotion as being aesthetically interdependent and sees expressive form as 'a provocative rhetoric' (p. 20) that aesthetically guides our attention in experiencing works of art. Like the experience of hearing a funny joke compared to an explanation of it.

As Kostas Terzidis (2003) suggested, the expressive has many advantages over the realistic and, whereas the computer-graphic quest for realism is essentially about completeness, *'notions of incompleteness, imperfection, and subjectivity'* invite interactive participation and have an expressive value that can surpass this explicitness. As Michael Davis (1999), a specialist in Greek philosophy and translator of Aristotle sees

it, mimesis should comprise '*a stylizing of reality in which the ordinary features of our world are brought into focus by a certain exaggeration . . . like the relationship of dancing to walking*' (p. 3). He concludes that 'the more "real" the imitation the more fraudulent it becomes.'

Thus, as the summarized explanation to what has been discussed in this section earlier, the meaning of expressive in the context of CGI character visualization could be referred to the quality of CG character creation that contents of inner experience rather than solely realistic portrayal, seeking to depict not objective reality but the subjective emotions and responses that objects and events arouse in them.

There are several approaches to create characters because each artist has its own style and level of experience. However, often the goal is to design characters which appeal to a large audience as possible. Accordingly, to McCloud (1993:24-59) this is achieved by making the character as simplified as possible, with less realism by limiting the amount of details. In order to create a character with empathy, CG artist gives consideration to portray an exaggerated reality of the character. This stylized CG character is supposed to feature a clear significant facial expression that communicates its emotions and readable body language which also uses to enhance the emotional state of the character (McCloud, 2006:62-101).

> '*When you present your (character's) personality clearly, your audience can relate to it as if it were just another human. It creates empathy and helps your audience see a better version of themselves*'
>
> *(Walter, 2011:15)*

Indeed, when discussing the result that should be achieved in CGI character visualization, the word **empathy** commonly would be mentioned alongside **expressive quality** of the character.

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2.8.1 Empathy

The word **empathy** originally from the German philosopher Robert Vischer, who used the word Einfuhlung, which means to enter feelings or be with a person's feelings, passions and suffering. The term has been familiarized in aesthetics, describing the ability to get "inside" an appealing piece of work, for example, art (Vischer, 1994:89-123). This makes empathy relevant to CGI character visualization, which can be seen as a new art form of representation.

> '*The idea of getting "into" a feeling is particularly important when we see and feel the world from the other's point of view, attempting to understand it, and seek to convey that understanding as we relate with those around us.' (Howe,2013:6-19)*

A common emotion to confuse with empathy is sympathy. The difference is that empathy puts oneself in others emotional shoes, while sympathy tells that you have walked there too. When someone is sympathy, he or she has feelings that are same as others, while being empathic is to know, sense or even "enter" the feelings of others, but the state of mind doesn't have to be the same. (Bellet, Paul, Maloney and Michael, 1991) Each individual varies in their ability to empathize, and the amount of empathy can shift depending on mood, situation or the people involved. Empathy is one of the more complex emotions and its popularity as a subject of study has increased steadily the past hundred years, but even more rapidly since the turn of the century (Howe, 2013:6-19).

What makes empathy one of the more complex emotions are that it requires cognitive effort, especially cognitive empathy which is based on *"seeing, imagining and thinking about the situation from the other persons point of view",* in order to do this, information of the person has to be shared, for example, personality, history or the situation, in order to set our minds into, imagining, what it might to be like that person

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(Howe, 2013:6-19).

Looking through in context of character visualization, the problem arises from the uncanny valley is how difficult it is for an audience to emotionally connect to a character which happens to fall into the uncanny valley. In this case, a lack of empathy with the character makes it hard in achieving appeal performance. Hooks et al. (2011) suggests that the most important element of a character is how that character emotes.

'In animation, creating the "illusion of life" boils down not to mannerisms and naturalistic movements but to emotion. The audience empathies with motion' (Hooks and Naas, 2011). In believing a character is alive, the audience must believe in the character's emotion and be able to relate to the feelings of the character. 'In ordinary language, empathy is often characterized as the ability to ''put oneself into another's shoes'' where this is meant to involve feeling the other's emotion within oneself.

2.8.2 Character's story

Storytelling is uniquely human and is a method of creating imagery, emotions and understanding, orally, visually or textually (Lidwell, Holden and Butler, 2010). Stories are powerful and have the ability to grab and hold attention, help people process information and imply causation (Weinschenk, 2011:76).

It is suggested that to create a socially accepted robot, it should maintain 'a history of past experiences' (Duffy, 2003). This means a machine that functions on a social level should remember what has happened to it in the past and to some extent learn and adapt to these events. If we consider this within the context of CGI character visualization, then this case could be applied to a character's story. In the film, *Short Circuit* (Badham, 1986), the character Johnny Five starts as part of an autonomous group of robots built for combat. These machines all look and behave the same.

However, after being struck by lightning he becomes 'alive'. Johnny Five later starts to behave differently, in a more childlike human manner. It expresses itself with mechanical

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eye lids that the other robot's also have. In the character construction form, there is no perceivable difference between Johnny Five and the other machines. Over the course of the film, the audience is taken through many emotional variations which Johnny Five leads. Johnny Five expresses himself through articulation of his body and the angling of his eye lids. In research conducted by Mather and Reichling, results showed that subtle changes in the angling of their test, robots eyebrows caused them to be judged differently. 'Angling the eyebrows caused a significant decrease in trusting behavior by the human subjects' (Mathur and Reihling, 2009).

By giving a character special traits, facial expression and pose, the viewer can infer much of the story, what the character is experiencing, by the scene that is represented. When applying them right, a character has been created that the audience can identify with, which is commonly used in film and television. (Freeman, 2003:1.2).

Figure 2.5: Johnny Five character in the film, *Short Circuit* (Badham, 1986)

2.9 The stylization of CGI character creation in Malaysia

The stylization of CGI character for today's animation industry in Malaysia is very much influenced by American and Japanese animation. However, a decade ago, the effort by cartoonist Ujang and director Kamn Ismail under Kharisma Production was the starting point to the local animation titles that could be seen today with *Upin & Ipin (*Figure 2.6)

and *Boboi Boy (*Figure 2.7) leading the way. (Mohd Amir Mat Omar & MD Sidin Ahmad Ishak, 2011). Hassan (2004: 7–8) described how a number of student animation projects reflected the identity of Malaysia's various races and heritage. According to him, there is no distinctive animation trend in Malaysia that can be considered unique or having a local identity (Hassan, 2008). Hassan also did not specifically mention the cultural characteristics contained within Malaysian CGI character. Hence, it would be a strong justification towards studying how culture is portrayed in Malaysian character animation, specifically focusing in character design. The issue in question here is whether or how a Malaysian culturally reflection and expressive design could be plugged as a soul into the CGI character creation.

Figure 2.6: *Upin and Ipin* (Image courtesy of Les' Copaque Sdn Bhd)

Figure 2.7: *Boboi Boy* (Image courtesy of Animonsta Studio Sdn Bhd)

In the past ten years, the growth of Malaysian animation industry does not seem to be moving as fast as what it has been expected. When tracing back to Malaysian CGI animation history, few significant animated TV series and movies were to be highlighted due to the strong press publicity that put on them at that time. In 2005, *Saladin, the animated series* (as Figure 2.8), which produced by Malaysian Multimedia Corporation (MDeC) made a news headline in the press. The first episode aired in late 2009, which afterwards, was considered as one of the biggest animation successes. Undoubtedly, for some extent, Malaysia should be enjoying some pride from the local industry success, which obviously could be seemed to be improving in the animation skills and technical aspects. At that time, some had claimed that the local industry was ready for the call from any international joint outsource projects from Hollywood. Of course, at the first place, one of the intentions of producing *Saladin, the animated series* was meant to stimulate the marketing growth of Malaysian animation industry. The adaptation of warrior story from Middle East might be conflicting in the aspect of content if it were to reflect or represent Malaysian animation as a whole. Thus, when looking at this point of view, there is still a gap in Malaysian animation industry that working on CGI contents based on local historical warrior.

Figure 2.8: CGI Character in *Saladin: the animated series* (MDeC, 2005)

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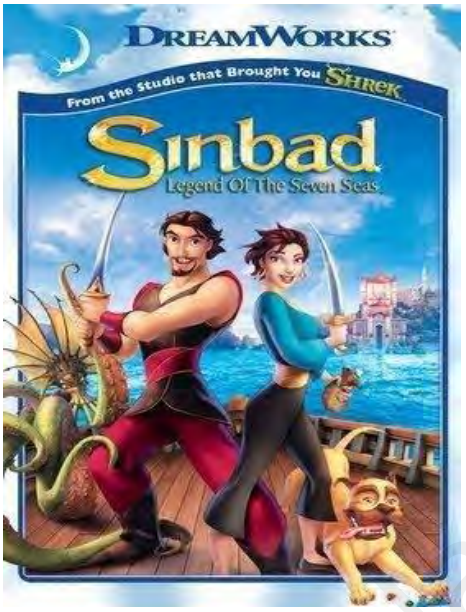

Figure 2.9: The animated movie,
Sinbad: Legend of the seven seas
(Dreamworks, 2003)

When observing through the originality of character design, the appearance of CGI characters in *Saladin, the animated series* reflected some similarities with the appearance of characters in the animated movie, *Sinbad, the legend of seven seas* (as Figure 2.9), produced by Dreamworks Animation in 2003. In 2012, *See Food* (as Figure 2.10), local produced animated movie also received many negative reviews by international film critics for its weakness in plot and character identification which reminds audiences to some treatment similarities with the famous animated movie, *Finding Nemo* (as Figure 2.10) by Pixar. This became one of the common local industry phenomenon that widely discussed among the creative people in the local industry. The discussion highlighted the issues of creativity and originality in local character design contents.

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Figure 2.10: *See Food (*left) (Silver Ant, 2012) and *Finding Nemo* (right) (Pixar, 2003)

Sometimes, the choice of story adaptation in CGI animated movie might be based on the main trend of high demanding plot at that particular time. Some local animation creators gave priority to the market trend in ensuring the great return of profit. For some extent, the in-depth studies of plot and character identification were not done properly before the production. This was in fact happened to the local produced warrior movie such as *Hikayat Merong Mahawangsa* (as Figure 2.11), which known to be originally based on old literary work. However, the movie narrative elements as such plot and characters were very much altered and reinterpreted to suit the current entertainment preferences. For some extent, many critics had given negative review to this movie for its failure to sustain the essence of reality in the aspects of cultural background and characterization if comparing to original literary work. Some of its scenes might presented a very much likely with dynamical feel of the Hollywood's movie, *300* (as Figure 2.11) in order to spice up the dramatic representation of the character. Of course, live shot character portrayal in *Hikayat Merong Mahawangsa* could be dealing with different set of methodologies when enhancing the character identification. When talking about character stylization, Disney and Pixar animation studios have already proven that

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Characters in CGI portrayal have a stronger advantage only if features of characters were to be exaggerated for some identification purposes to portray character specific personality and cultural background, providing with the effective guide of framework. This means the new media application as such CGI character visualization should be taken as a tool to continue in exploring local content as such, Panglima Bukit Sadok.

Figure 2.11: *Hikayat Merong Mahawangsa* (left) (KRU, 2011) *and 300* (Warner Bros, 2006)

2.10 Panglima Bukit Sadok

The adapted story for this representation was learned through the previous research paper of Mr. Aloysius Yapp, *Rentap: adaptasi cerita legenda ke dalam bentuk animasi 2 dimensi*, which published in 2007.

Panglima Bukit Sadok is the story been told from generation to generation. PBS last stronghold was located at Mount Sadok, the upstream of Batang Layar. The mainstreams of tribal warrior were from Saribas river, Saka river, Paku river. (Yapp, 2014)

The history started around 1842 when James Brooke declared his kingship in Sarawak. Due to that, the native leader and chief from inland of Borneo launched the war with Brooke until 1868. Dana the chief from Saribas led a group of warriors from his

territory to join with the other at Bukit Keramat and lastly build their stronghold at Nanga Tiga. But he lost his fight and inherited by Linggir from Layar. He was a capable leader until the war at Beting Maro at the mouth sungai Saribas. He disappeared after that fight. Around 1850, Libau led the fight. He was from upstream of Ulu Skrang. After won the fight at Nanga Lang he led his warriors to join the warriors from other territory at peak of Mount Sadok. (Yapp, 2014)

James Brooke stormed Mount Sadok fortress for the first and second expedition, yet he failed. He lost his pride during those expeditions. Then Libau declared his kingship as inland king. Brooke's regimen brought canon called Bujang Sadok for the third expedition and the won the fight. Libau and his follower managed to escape to 6th division and continued their fight until 1868. (Yapp, 2014)

2.10.1 The existing media representation of character and new approach

The cultural heritage is at stake of losing its touch as the time passed by. This might be due to the fact that it is hardly remembered and passed down. In the existing literature, *The process of developing the art of Panglima Bukit Sadok*, which published by Mr. Aloysius Yapp in 2014, has shown that existing representation of Panglima Bukit Sadok character was in two-dimensional art form. The character was presented in the form of illustration, drawing and sketches (as figure 2.12, 2.13 and 2.14). Besides it also includes the workflow for the entire art development process.

The visualization of character through CGI application have become a new media in portraying any historical figures. Through this new media, culture, history and heritage could be recorded and preserved in a better form. It is easily could be accessed and it does not cost much as compared to preserving in sculpture or other traditional media. The CG characters' creation for historical figure representation would be sustained as a part of cultural and heritage preservation even though their actual real life figure has long gone

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in history. Along the path, the present research is also helpful in promoting the development of the local cultural preservation, specifically in focusing on local legendary figure namely Panglima Bukit Sadok.

Figure 2.12: The warrior from the North of Mount Keramat (Yapp, 2014)

Figure 2.13: Warrior from the upstream of Nanga Tiga. (Yapp, 2014)

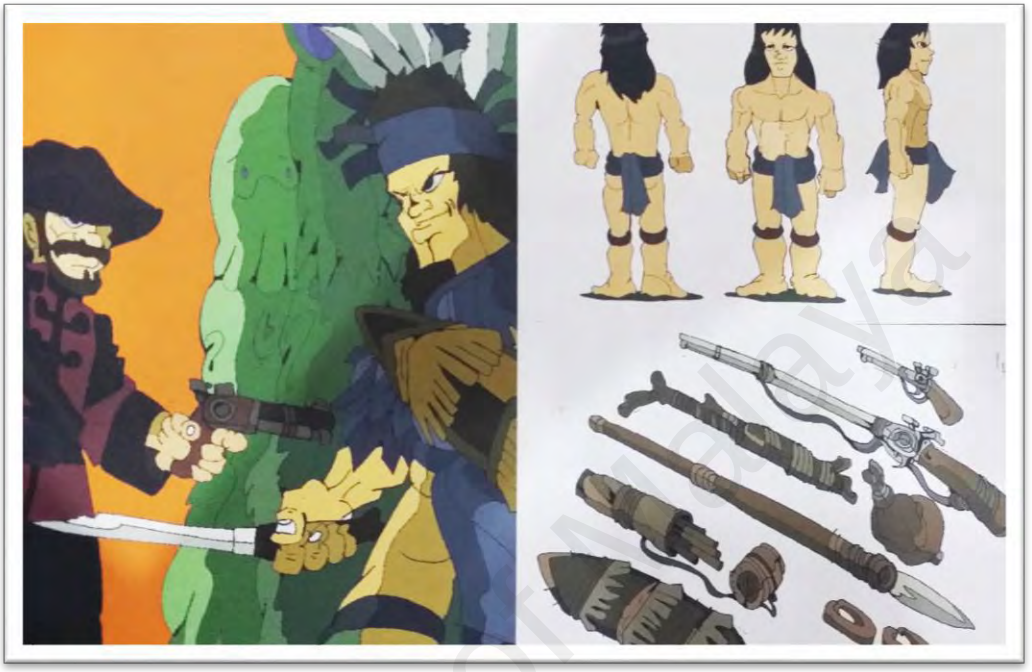

Figure 2.14: Illustrations of Panglima Bukit Sadok. (Yapp, 2013)

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CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Following the foundation structured down by the second chapter as above, this research will proceed with other contents as discussed in the chapter one. From the first chapter, it was made known that this section aims to described how the research will be conducted, highlighting the objective, methodology and approaches for the research.

The general objective of this study is to implement the exaggeration as a principle in enhancing CGI character visualization of Panglima Bukit Sadok. This study was meant to answer all the research questions that mentioned in chapter one.

The researcher chose to incorporate a qualitative interview approach in order to address this objective through analysis of the experiences of CGI experts in creating CGI characters through the implementation of exaggeration principle. In this chapter the researcher provides description of the methods used to answer the research questions. The research design is followed by a description of the selection of the participants and provides a profile of each CGI experts and their employment site. Researcher would explain how he collected data, analyzed the data, and validated the research procedures and outcomes.

3.2 Research Design

A qualitative research approach was adopted throughout this study. Qualitative research involves the use of data to investigate unique issues associated with interpretative tradition that focuses on institutions or people with the aim of finding multiple truths from different perspectives. (Robert-Holmes, 2006)

This qualitative research incorporates a semi-structured one-on-one interview with the participants. With the goal of self-disclosure among participants, (Nall, 2010, p.1) the semi-structured interviews assisted in answering the question 'What are the significant

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roles of exaggeration principle and how to implement exaggeration principle to achieve expressive quality in CGI character visualization of Panglima Bukit Sadok?' The research subject was guided through semi-structured interviews to understand how interventions work and how they could be improved. It also allows participants to discuss and raise issues that researcher may not have considered. The method gave the opportunity for the interviewer to explore particular subjects and responses further.

Merriam (2009) reported that the main purpose of an interview is to obtain a special kind of information (p. 88), and those interviews are necessary when a researcher is interested in past events that are impossible to replicate (p. 88). The semi-structured interviews include a mix of more or less structured interview questions, all questions are used flexibly, usually there is specific data required from all participants, the largest part of the interview is guided by a list of questions or issues to be explored, and there is no predetermined wording or order (p. 89). Ultimately, the researcher is to uncover the essence of an individual's experience (p. 93).

Patton (2002) suggests that the research in an interview endeavors to find out what is *'in and on someone else's mind'* (p. 341). Patton explains further:

> *'We interview people to find out from them those things we cannot directly observe…we cannot observe feelings, thoughts, and intentions. We cannot observe behaviors that took place at some previous point in time. We cannot observe situations that preclude the presence of an observer. We cannot observe how people have organized the world and the meanings that they attach to what goes on in the world. We have to ask people questions about those things. The purpose of interviewing, then, is to allow us to enter into the other personality'.*
>
> *(pp. 340-341)*

Semi-structured interviewing, according to Bernard (1988), is the best to be used

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when researcher will not get more than one chance to interview someone. In this research, the chosen interviewees consisted five CGI experts who are commonly tied up with the busy schedule at their working places. Therefore, an appropriate plan has to be prepared before the interview took place. Cohen (2006) stated that it is necessary for the interviewer to develop and use an 'interview guide' which included a list of questions and topics that need to be covered during the conversation, usually in a particular order. Cohen (2006) also stated that the semi-structured interview guide provides a clear set of instructions for interviewers and can provide reliable, comparable qualitative data. They are often preceded by observation, informal and unstructured interviewing in order to allow the researchers to develop a keen understanding of the topic of interest necessary for developing relevant and meaningful semi-structured questions. The inclusion of open-ended questions and training of interviewers to follow relevant topics that may stray from the interview guide does, however, still provide the opportunity for identifying new ways of seeing and understanding the topic at hand. (Cohen, 2006).

The idea of conducting the semi-structured interviews in this research was intentionally to open opportunity for researcher to do an in-depth study upon the answers from the participants. Denscombe (2006) described the semi-structured interview as the outcome of open-ended questions that provides the interviewee the opportunity to elaborate on the topic under study. This design was chosen in order to give the participants the chance to express their views on the research issue under discussion as well as to help in providing answers to the research questions.

The interview questions were drafted by the researcher and reviewed by research course supervisor for wording, syntax, and applicability to the research questions in an effort to validate the research questions.

Interviewing experiences can be intense interpersonal experiences. The interviewer was considered as the instrument in this type of evaluation (Guba & Lincoln, 1981, as

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cited in Patton, 1987). The "instrument" can be affected by factors like fatigue, personality, and knowledge, as well as levels of skill, training, and experience. Patton (1987) stated that that any face-to-face interview is also an observation. The skilled interviewer is sensitive to body languages, environmental effects on the interview, and nuances of the relationship. While these subjective factors are sometimes considered threats to validity, they can also be strengths because the skilled interviewer can use flexibility and insight to ensure an in-depth, detailed understanding of the participant's experience.

Many researchers like to use semi-structured interviews because questions can be prepared ahead of time. This allows the interviewer to be prepared and appear competent during the interview. Based on Kruger, each structured interview questions were designed to uncover important elements. The interview questions were included Opening Question (in order to stimulate conversation and share experiences), Introductory Question (to develop with more specificity and examples), Transition Question (in order to develop with more specificity and examples), Key Question(s) (in order to develop a specific position relative to a concept and start to drill down to the core issue of the study), and Ending Question (to serve as an open-ended opportunity to develop points relative to the research problem being examined) (Krueger, 2002).

Merriam (2009) stated that the interaction between the interviewer and interviewees was respectful, non-judgmental, and non-threatening. The very personal, conversational nature of interview situations highlight many of the basic ethical issues of any research or evaluation method (Patton, 1990). In order to overcome the ethical issues of semi-structured interviews, the interviewer made efforts to put the interviewees at comfortable state by assuring confidentiality, avoiding bias, establishing a good sense of understanding and trust, explaining the format and the sequence of topics, incorporating a logical pattern to questions, maintaining an appropriate pace, and keeping timeframe commitments for each interviewee.

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Typically, the interviewer of semi-structured interview has a paper-based interview guide that to be followed. Since semi-structured interviews often contain open-ended questions and discussions may diverge from the interview guide, it was generally best to tape-record interviews and later transcript these tapes for analysis.

3.3 Samplings

Sharan Merriam (2009) stated that the nature of qualitative research method analysis demands the use of non-probability sampling, as opposed to probability sampling.1 Merriam suggests that because qualitative research method analysis is concerned with answering questions regarding how a process works or unfolds, using probability sampling is not useful or appropriate (p.77). Instead, Merriam suggests that researchers use the most popular type of non-probability sampling, purposive or purposeful sampling. Purposive or purposeful sampling encourages analysts to pick case studies that are "information-rich" (Merriam, p.77). This method is based "on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned" (Merriam, p.77). There are a wide range of purposive sampling that researchers can use. (Patton, 1990). It is necessary for the researcher to determine which type of purposive sampling that suitable to be employed. In this study, the researcher decided to use expert sampling, a type of purposive sampling that is used when the research needs to glean knowledge from individuals that have **particular expertise**. This expertise may be required during the **exploratory** phase of qualitative research, highlighting potential new areas of interest or opening doors to other participants. (Patton, 1990). Expert sampling is particularly useful where there is a lack of empirical evidence in an area and high levels of uncertainty, as well as situations where it may take a long period of time before the findings from research can be uncovered. (Patton, 1990). Therefore, expert sampling is a cornerstone of

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a **research design** known as **expert elicitation**. (Patton, 1990, 2002; Kuzel, 1999).

In this research, expert sampling was identified to suit the study approach. The participants were selected based on their expertise reasons which could be understood through reviewing on their profile status below.

The interviews were conducted for four months which started from the early month of December 2015. The interview sessions were conducted at the convenient location for the participants (living hall of their houses) to avoid any cause of interruption to their daily working schedule. Each interview sessions took more less around 2 to 3 hours of time and were mostly scheduled at night.

3.4 Study Participants

A total of five participants were selected based on their expertise reasons in CGI character visualization field. They are CGI experts who possessed a good understanding of animation and design principles, specifically have plenty of experiences in working on the CGI character visualization projects for local and international animation industry.

Amongst those five selected CGI experts, two of participants (Alymer Lee Shao Sun and Kevon Tan Soon Chee) are currently employed in local high profile animation studios and another two participants (Eric Tan Chin Hock and Golam Moshiur Rahman Choudhury) hold the high rank position in the animation studios based at Beijing, China and Dhaka, Bangladesh. Besides, another one participant (Aloysius Yapp) is a local academician and scholar, who specializes in animation and Iban cultural studies was selected to participate intentionally in providing his perception towards the researcher's study of Panglima Bukit Sadok character in CGI form. As mentioned in chapter one, this research is actually an extended approach to study from the existing research paper of Mr. Aloysius Yapp. Therefore, the involvement of this participant was considered crucial for data collection of this research because apparently, there was no attempted research

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specifically on Panglima Bukit Sadok character.

Below are the overview profiles of the study participants:

Respondent 1: Mr. Eric Tan Chin Hock

Mr. Eric Tan Chin Hock is currently working as Creative Director (CD) in Edsenses Creative Consultancy Co. Ltd, based at Beijing, China. He started his career as a Graphic Designer, and later transferred himself into the digital era of visual effects and animation. He has been in the media and film industry for about eighteen years, and constantly looking for new ways to improve productivity and maintaining the high quality of work.

Eric's experience as a VFX supervisor for about nine years has gained him a lot of pre-production, production and post-production insight, which given him the ability to work on multiple level of projects, from high profile work to low budget production. Even he worked as a Director for a short period of three years but he has already produced twenty over CGI animation works. At times he also worked as a VFX supervisor for other directors internationally in film and advertising industry. He constantly gained learning experience of production from multiple directors, director of photography, and film crew from different countries around the world. Besides, he also shared and gave advice to Directors on visual effects shots, as to create a stunning visual on their film or commercials.

Respondent 2: Mr. Aloysius Yapp

Mr. Aloysius Yapp is a lecturer of Universiti Tunku Abdul Rahman, who dedicated to cutting edge engagement with animation and related moving image practices. Aloysius is a scholar, animator, having published widely in the studies on local cultural preservation through new media, and written and produced numerous animation projects for the cultural preservation of Iban warriors.

Aloysius's few significant publications include *The Art Of Panglima Bukit Sadok: The Process Of Developing Web Based Media Through Illustration And Graphic In*

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Preserving Its Culture (ISBEIA, 2014), *The Art Of Panglima Bukit Sadok* (Perpustakaan Negara Malaysia, 2013), *Borneo Virtual Reality: A Walkthrough* (UTARRF, 2015), and *BRT- Borneorobot* (ScienceDirect, 2015*)*.

Apart from publications, Aloysius also actively involved in producing his own 2D animations. The animation of Panglima Bukit Sadok earned him the Asia Digital Arts Award at Fukuoka, Japan in 2004. It was picked for viewing in Venice Film Festival and Cannes Film Festival in 2005.

Currently, Aloysius holds the position as chairperson of Centre for Immersive Technology and Creativity (CITC), a research center with a vision of heritage and cultural preservation that located at Universiti Tunku Abdul Rahman. By carry this position, Aloysius has hope to share his passion and dream with all the members of the center by inspired them with a lot of creative research collaboration within the members from different kinds of discipline.

Respondent 3: Golam Moshiur Rahman Choudhury

Mr. Golam holds a position as Chief Executive Officer (CEO) and Managing Director of Dreamer Donkey Limited, one of the top most influential animation studio at Bangladesh. He began his career as CGI Artist and animator since the years of 90's. He received Master of Arts in Animation from University Technology Mara Malaysia in 2011 and Diploma in Animation and Multimedia from LimKokWing University of Creative Technology in 2006. He also received Bachelor of Arts (HONS) in Fine Art (Drawing and Painting) from Dhaka University, Bangladesh in 1999.

Golam's research interest includes the studies of character identification, new technology approaches in CGI visualization and animation. He received many awards for creative and academic excellence. He is the member of Society of Animation Studies (SAS), and worked as the faculty member in some international well-reputed academic

institutions as such LimKokWing University of Creative Technology, Linton University College, East London University (Malaysia). He also worked as a consultant with several animation studios in Bangladesh, Malaysia and United States.

Respondent 4: Mr. Alymer Lee Shao Sun

Mr. Alymer Lee Shao Sun has eighteen years of working experience in the CGI and creative education industry. He worked as CG artist at Capio Kinetics Sdn Bhd, one of the pioneer animation studio in Malaysia. He involved in numerous of high profile animation and post production projects for local and international commercial brands such as Sime Darby, Adidas, Hishamitsu, and Yokohama.

Alymer received several awards for creative and academic excellence throughout his working years. His main interest and specialization are in CGI character visualization and animation. With his passion for the CGI research, he had experienced a wide diversity of technical problem solving in every project he had taken, specifically in character visualization in CGI form.

With many years of industry experience, Alymer contributed his skill and knowledge in CGI through his many lectures at higher institutions, such as Sunway University and INTI University in Malaysia.

Respondent 5: Kevon Tan Soon Chee

Kevon Tan Soon Chee works as CG Technical Supervisor in Tripod Group of companies, a media group offering production services to assist international filmmakers shooting in Malaysia and its region, and providing world-class post-production, visual effects and 3D stereoscopic services. Tripod Group which based in Malaysia also develops and produces animation Intellectual Properties. As a part of the core team member, Kevon also served as 3D Animation Director for Tripod's first stereoscopic 3D animated feature War of the Worlds: Goliath, which won Best 3D Animated Feature at the Los Angeles 3D Film Festival 2012 in hot competition with Hollywood animated

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blockbusters.

3.5 Validity and Reliability

Rolfe (2006) stated that although the tests and measures used to establish the validity and reliability of quantitative research cannot be applied to qualitative research, there are ongoing debates about whether terms such as validity and reliability are appropriate to evaluate qualitative research. In the broadest context these terms are applicable, with validity referring to the integrity and application of the methods undertaken and the precision in which the findings accurately reflect the data, while reliability describes consistency within the employed analytical procedures (Long T, 2000). In order to ensure both validity and reliability with the study, the researcher incorporated member checking and data triangulation.

Member checking is primarily used in qualitative inquiry methodology and is defined as a quality control process by which a researcher seeks to improve the accuracy, credibility and validity of what has been recorded during a research interview (Barbour, 2001; Byrne, 2001; Coffey & Atkinson, 1996; Doyle, 2007; Lincoln & Guba, 1985). During an interview, the researcher restated or summarized information and then questioned the participant to determine accuracy. The participants either agree or disagree that the summaries reflect their views, feelings, and experiences, and if accuracy and completeness are affirmed, then the study is said to have credibility.

While considering reliability, Merriam (2009) explains as follows:

> *Due to what is being studied in the social world is assumed to be in flux, multifaceted and highly contextual, because information gathered is a function of who gives it and how skilled the researcher is at getting it, and because the emergent design of a qualitative study precludes a priori controls, achieving reliability in the traditional sense is not only fanciful but*

impossible (p.222).

Based on the factors above, replication of a qualitative study is impossible and will not produce the same results. Although the study lacks reliability, if replicated, the validity constructs as found above shall support the study design and produce outcomes that can be applied.

Patton (2002) stated that data triangulation is a method used by qualitative researchers to check and establish validity in their studies by analyzing a research question from multiple perspectives is to arrive at consistency across data sources or approaches. In fact, such inconsistencies should not be seen as weakening the evidence, but should be viewed as an opportunity to uncover deeper meaning in the data.

Therefore, in order to obtain the right data for triangulation, a proper organization needed to be structured before conducting the interviews. An appropriate interview guides were prepared by the researcher to help him to collect the right kind of data and make the necessary input correlations during the data analysis. The interview guides consisted the interview questions which constructed to be aligned with and in support of the research questions that frame the study. The research questions followed the themes of the literature that informs the study phenomenon. In effort to validate the interview questions, the research supervisor reviewed the interview questions for wording, syntax, and applicability to align with the research questions.

3.6 Data Collection

The aim of the research to **formulate** a proper framework for CGI character visualization of Panglima Bukit Sadok. The researcher suggested the implementation of exaggeration principle in CGI character visualization of Panglima Bukit Sadok. The semi-structured interview seeks to determine the importance of exaggeration as main principle in enhancing CGI character visualization by looking into its significant roles.

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The interviews also helped the researcher to justify the relationship of exaggeration principle with other components of animation principles in CGI character visualization. Align with it, the interviews shed light into the definition of *expressive quality* in CGI character visualization and the obtained data offered some clarity to what extent the *expressive quality* can be achieved in CGI character visualization of Panglima Bukit Sadok.

The construct of the interviews allowed for the sessions to be audio-recorded. The most common method of audio recording offers a database for analysis (Merriam, 2009, p. 110). All interview session data were transcribed, observer comments were made, as well as notations of observations of interview participation.

The format of the interview transcript was well structured to enable analysis. At the top of the first page of transcript, identifying information was noted as to when, where, and with whom the interview was conducted, in addition to line numbering down the left hand margin (Merriam, 2009, p. 110).

The interviews were conducted at the convenient location in order to ensure that participants were at comfortable state to talk honestly. Therefore, all interviews took place at the homes of the study participants. The study participant appeared to be more relax at their own living space, breaking away from working environment. Some of the participants even suggested to be interviewed at their own home based studios which allowed them to present some of their CGI character creations. Sometimes, those visual samples were necessarily needed to give a better picture for any explanations while responding to interview questions. This was also very important to give assurance to the privacy and confidentiality of their own creations.

Initial data collection is directed by the selection of study participants who are likely to demonstrate the phenomenon under investigation (Rennie, Phillips & Quartaro, 1988). In order to develop inferences and models, all transcripts were coded; categories

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were established that are responsive to the research and the issue being examined. The method of constant comparison describes the process of systematically categorizing data through processes of data collection. The categorization according to themes emerging in the data, and the sampling of additional data on the basis of those emerging themes. The researcher looked for similarities and differences between concepts in order to ensure the data are fully explored (Henwood & Pidgeon, 1992).

When coding and reporting data, efforts were made to what findings are more relevant to report. The researcher needed to recognize themes drove the data that were reported. The researcher searched the transcript text for recurring words or phrases. This qualitative data reproduction and sense-making effort analyzed a volume of qualitative material and attempted to identify core consistencies and meanings (Merriam, 2009, pp. 189-191) in order to address the research questions.

3.7 Interview Questions Analysis

At the data collection stage, the researcher basically expected for the useful data that able to lead him to the research findings that meant to provide answers to all the research questions. Therefore, it is very important to ensure the constructed interview questions to be aligned with and in support of the research questions that frame the whole study. In fact, the research questions were analyzed to follow the themes of the literature that informs the study phenomenon. Table 3.1 was organized by triangulating the interview questions that align with the research questions and research cited in the literature review.

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Table 3.1: Interview questions alignment with research questions and theorists

Interview Questions	Research Question Supporting	Theorists
1. Many creations of CGI character are intentionally exaggerated: Can you please define what makes the exaggeration so **important** for CGI character visualization?	Importance	Thomas and Johnson (1995)
2. To support the character posture and emotion: Can you please justify, the **significant roles** of exaggeration principle?	Significant Roles	Simeon Rowsell (2010)
3. Exaggeration and styling in CGI characters is extremely required: Can you please determine, what are the **effectiveness** on visual outcome?	Effectiveness	Karl F. MacDorman (2009)
4. Particularly, when implementing exaggeration principle, shapes and proportions are required to be considered in designing character personality traits: How do shapes and proportions be **relevant** to this matters?	Relevance	Hanna Ekstrom (2013) Walt Stanchfield (2009)

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Table 3.1, Continued.

5. Exaggeration principle is not meant to be standalone animation principle. However, it would be implemented with the consideration of Staging, Solid drawing and Appeal principles: Can you please clarify what are the **relationship** of those principles in supporting the exaggerated character personality?	Relationship	John Lasseter (1987) Thomas and Johnson (1995)
6. (Expressive quality) is needed to be achieved in CGI character visualization: From your field experience and understanding, what are the **qualities** need to be achieved?	Achievement Qualities	Kostas Terzidis (2003) McCloud (1993)
7. From the visual presentation on figure 3.1, what is your overview **interpretation** about the visual CGI character?	Interpretation	Aloysius Yapp (2014) Judith Butler (2007)
8. After reviewed and interpreted the presentation on figure 3.1, what can you suggest on the applicable approach for **refinement** quality?	Refinement approach	Aloysius Yapp (2014) Judith Butler (2007) Walter Scott (2000) Ed Hooks (2013)
9. Apart from the entire inquiries in this interview session, is there any **additional relevance** statement that you would like to explain?	Additional Relevance	Hanna Ekstrom (2013)

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3.8 Visual Experiment

CGI Character Visualization of Panglima Bukit Sadok was practically developed and created by the researcher in the year 2013. Initially, this visual representation was designed and generated without any guide of framework, which supposed to be based on. From idea development till work execution was totally according to the researcher's own preferences, skills and knowledge.

The adoption of the researcher's first creation of CGI character of Panglima Bukit Sadok was used as a visual experiment to allow study participants (CGI experts) in providing their perceptions or comments towards this character creation by evaluating its quality in expressing character personality and identity, as well as maintaining its appeal and interest to audiences. From the obtained responses, the researcher attempts to gain some useful recommendation from the CGI experts, approaching for future refinement of this CGI character creation. Perhaps, second creation of CGI character of Panglima Bukit Sadok should be planned in the line after the completion of this research.

Study participants would be taken a few rounds of observation to the visual as Figure 3.1 below before answering the relevant interview questions that prepared by the researcher.

Figure 3.1: CGI Character of Panglima Bukit Sadok (Goh Kiang Kuan, 2013)

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3.9 Data Analysis

The analysis of data examined the responses obtained from study participants. At this stage, the researcher examined any useful responses that related to research questions. The study triangulated the research questions, the interview questions, and the data coded in the research process. The researcher engaged in the analysis of data processed to answer research questions (Merriam, 2009, p. 176).

This qualitative content analysis involved a process designed to condense raw data into categories or themes based on valid inference and interpretation. This process used inductive reasoning, by which themes and categories emerge from the data through the researcher's careful examination and constant comparison. Code categories or themes were established from the interview transcripts. Categories of data were organized, whereupon the data were appropriately characterized based on relevant categories. When developing categories or themes inductively from raw data, the researcher used the constant comparative method (Glaser & Strauss, 1967), since it is not only able to stimulate original insights, but is also able to make differences between categories apparent.

3.10 Limitation

The limitation to this particular research is related to its scale. Since it is a small-scale case study research, it is impossible to generalize the findings through a broader perspective. This research aimed to formulate a proper framework for CGI character visualization of Panglima Bukit Sadok. The research is limited by the opinions shared by the study participants and has to assume that those thoughts are honest and truthful. Similarly, the study relied on the experiences of study participants (CGI experts) and, by extension, the way in which they were constraint by the usual working pipeline and organization of their workplace according to the areas of CGI industry. As such, the CGI

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experts from animated film industry would have slight of differences in their perceptions against CGI experts from game industry, especially when sharing their knowledge in pipeline or workflow for character visualization. Those differences of perceptions might be challenging for the researcher in analyzing the obtained data within the case of study but looking at another advantage, this limitation could become a useful emerging phenomenon that potentially is opened to be explored.

3.11 Summary

This chapter explained the strategies of research methodology that employed in this research. This included the researcher's elaboration to the adoption of qualitative research approach incorporates a semi-structured one-on-one interview research design, the employment of purposeful sampling and the procedure for data collection, as well as the procedure for data analysis to conduct the research.

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CHAPTER 4: DATA ANALYSIS

4.1 Introduction

In this chapter, the researcher presented the participant interviews and analysis of data. The data analysis was based on the following research questions:

RQ 1: What are the **significant roles** of exaggeration principle in CGI character visualization?

RQ 2: How does the exaggeration principle **relevant** with the other components of animation principles in CGI character visualization?

RQ 3: To what extent the **expressive quality** can be achieved in CGI character visualization of Panglima Bukit Sadok?

The chapter is organized according to nine major themes that identified from the qualitative coding process for the five study participants. This analysis will determine the extent to which the views of study participants (CGI experts) reflected in practice and whether the practice was comparable to the themes that emerged from the data as identified in the literature.

The nine major themes that emerged are as follows:

- Importance of exaggeration in CGI character visualization.
- Significant roles of Exaggeration principle.
- Effectiveness of visual outcome in CGI character exaggeration.
- Relevance of shapes and proportions in Exaggeration principle.
- Relationship of Exaggeration principle with Staging, Solid Drawing and Appeal principles.
- Expressive Quality: Achievement qualities in CGI character visualization.
- Visual experiment of Panglima Bukit Sadok CGI character: The interpretation.

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- Visual experiment of Panglima Bukit Sadok CGI character: Refinement approaches.
- Additional relevance of research.

4.2 Importance of exaggeration in CGI character visualization

Five CGI experts were interviewed to elicit their views on the importance of exaggeration in CGI character visualization according to their experiences in the animation industry.

Respondent 1 explained that the exaggeration is important practice used in developing a character in CGI animation industry. He said that the CGI characters are intentionally exaggerated to support the stylization of the animation. Commonly, the uniqueness of animation could be obviously identified through the style of character creations. He also elaborated the stylization of character is the outcome that obtained after the exaggeration process was implemented on the character.

Respondent 2 also expressed the same opinion when he said exaggeration is very important in providing some significant elements for the identification of a character. He emphasized that, a unique portrayal of character identification helps to enhance the visual attraction to any animation.

By taking a view into another side of the region, respondent 3, a CGI expert who based at Dhaka, Bangladesh also shared a same opinion when he said that the exaggeration is crucial for character design development. He explained that it is a great privilege of CGI visualization and animation, a designed character could be easily exaggerated to get the uniqueness of style. In fact, respondent 3 also mentioned that for years he has been struggling to create a significant style that could reflect Bangladeshi animation, particularly in the scope of character design development. He pointed out the exaggeration as key approach into stylization of reality. He emphasized that exaggeration is the main principle that he would take into consideration when designing

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a style of character based on reality.

However, two of the CGI experts, respondent 4 and respondent 5 responded their views with slightly contrary to the above statement. With regards to the importance of exaggeration in CGI character visualization, respondent 4 argued that the exaggeration only necessarily important in creating stylized character. According to hi m, there is no purpose to exaggerate the character if the character is meant to be in realism based on the needs of story. He explained that the ideation process of stylization is very much depending on the story of animation. Therefore, he stressed that story constraints must be put into account before proceeding to character design development.

Besides, respondent 5 also shared a similar opinion when he explained that exaggeration is only applicably important for cartoon or stylized character which he thinks as the key of implementation process to develop stylization of character. However, based on his opinion, either the cartoon character, stylized character or the character with highly realistic portrayal, all could still become the visual attraction to viewers if the whole creative contents are well planned, organized and executed.

Analysis:

The above comparable statements determined the importance of exaggeration in CGI character visualization, as it reflected a greater positive response from the study participants. Through the findings, all the study participants expressed their views with common agreement that exaggeration is necessarily required as main principle to be practiced when developing the stylization of CGI character. The uniqueness of character's style is the outcome that obtained after the exaggeration process was implemented. In the other way of saying, exaggerating a character is to be based on the reality in order to achieve stylized result, as what it could be described through visual diagram on Figure 4.1. Furthermore, this statement is also compatible with the facts indicated in the literature review section 2.4.

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Figure 4.1: The stylization through Exaggeration principle

4.3 Significant roles of exaggeration principle

In order to define exaggeration principle in CGI character visualization, it is essential to obtain the further in-depth views from the five study participants (CGI experts) for justifying the significant roles of exaggeration principle in supporting the character's posture and emotion.

According to respondent 1, certain specific features of body posture and facial expression are purposely presented with more extreme than the reality as to give a stronger emphasis on character personality traits. He stressed that a strong dominant feature which is purposely exaggerated would enhance the character identification.

With regards to above statement, respondent 2 shared a same opinion when he explained that Exaggeration principle is one of the most important principle been developed since the Nine Old Man era. It's one of the approach been carried out to establish identification of a character. He added that exaggeration principle plays a significant role to amuse audiences with lot of unexpected dynamic postures and dramatic facial expressions that indirectly would bring in some anticipation to the story.

Respondent 3 also expressed the same view by saying that significant role of exaggeration is to capture the essence of gesture or emotion based on the reality and express it to the audience in a clear and understandable way. Therefore, according to him, this would become the main reason why the CG artists prefer to give emphasis on creating the caricature of body posture and facial expression, as the best way to portray the character's special traits. Besides that, he mentioned that a clearer portrayal of character's

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identification through exaggeration would have a strong advantage to reflect specific essence of cultural identity.

Respondent 4 also explained that the appearance of a character (body and facial) must be esthetically outstanding in viewer's eyes as to spice up the story of animation. He said if the story involves many characters, each of the characters must have their own unique identification. According to him, the exaggerated body posture and facial expression of each characters are not only meant to reflect clear demographic information of character's age, weight, gender, background and culture, but also to support the uniqueness and peculiar qualities of characters' personality which related to behavior, thought and emotional state of individual.

Respondent 5, in his explanation emphasized that exaggeration principle plays a significant role to enhance nonverbal communication of CGI character with the audiences. According to him, a clear message is expected to be delivered to the audiences through exaggerated body language and facial expression to determine certain action and emotional state of character, as an approach to support the plot of any animation.

Analysis:

According to the above statement from five respondents, the analysis revealed the facts that exaggeration principle plays a significant role in giving a clearer body language and facial expression to determine certain body language and emotional state of character. A certain extremity of dominant features is presented on character body and facial in order to enhance character's identification. Exaggeration principle is implemented to give a strong portrayal to character personality traits which also became an advantage in reflecting specific essence of cultural identity. This creative way of portrayal is no doubt became the most effective nonverbal communication of CGI character with the audiences. The following figure 4.2 diagram described in simple visual form to understand significant roles of Exaggeration principle in the context of character creation.

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Demonstration of diagram is crucial here as to show a clearer linkage and interrelated connection of those terms.

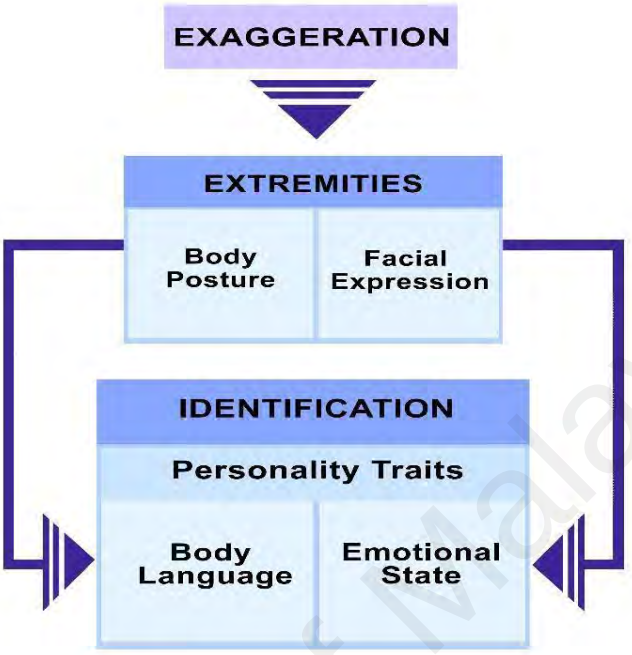

Figure 4.2: Significant roles of Exaggeration principle

4.4 Effectiveness of visual outcome in CGI character exaggeration and stylization

Combination of good design components in any visual presentation is meant to impress audiences. Similar to animation production, CGI character would appear as one of the main design components in animation that could able to emotionally touched millions of audiences. Thus, the effort for creating exaggerated and stylized CGI character somehow extremely require to bring effectiveness to visual outcome in any platform of presentation. This brought to the researcher's attention to seek for understanding of real industry practices. The researcher carried his task to obtain information from five study participants (CGI experts) that would able to determine the effectiveness of visual outcome in CGI character exaggeration.

With regards to the effectiveness of visual outcome in CGI character exaggeration

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and stylization, respondent 1 explained that exaggerated and stylized characters would give more appealing visual outcome compared with realistic character. As he explained earlier, the dominant features were emphasized into certain extremities by referring from reality. Intentionally, those extremities would attract people's attention. In fact, respondent 1 was actually referred to the positive reaction from the people.

According to Respondent 2, the effectiveness of visual outcome in CGI character exaggeration and stylization must be traced back to the development of CGI animation particularly in Hollywood movie industry. He gave the evidence of significant projects like *Polar Express*, *Mars need mom, Beauwolf* that carried flag to wave for the visual outcome with realistic appearances. Yet, he explained that those animated movies could not achieve the positive results as much as *UP, Mr. Incredible* and many more which encompassed towards the character building by engaging with exaggeration principles. He also explained with logical thought that no one needs the exact imitation of reality. People are bored with the representation of realism and in fact so much possibilities could be extended into surreal world. People wanted to see something beyond the imagination and curiosity. Therefore, respondent 2 stressed that exaggeration and stylization in CGI characters would carry great effectiveness for visual outcome.

Respondent 3 also expressed that exaggerated and stylized character has more charisma compared with realistic character. He explained that character with charisma would stimulate the emotional response from audiences. He gave an example if exaggeration principle to be implemented to a fat man. A fat man will be looked much fatter by expressing his extremities in weight and mass. He believes that the extremities of a design help to capture that essence and creates a stronger impact with the audience. According to him, the extremities on character's appearance also convey a clearer emotional state for audiences to feel empathy with certain situation.

Respondent 4 believes that exaggeration and stylization in CGI character would

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create impact on the visual outcome. He emphasized that the story as the key of animation. According to him, every story tells a story of character. Before story was told, character personality must be established according to the needs of that story. By referring to animation industry particularly, he mentioned that character would be introduced within a very limited time. Therefore, he stressed that exaggeration and stylization in CGI character is an effort to create a surprising nonverbal introductory to specific character personality. Besides, he also further elaborated that certain esthetic value was achieved through uniqueness of style that gave more visual impact to support the story of the animation.

Respondent 5 shared his thought by saying that exaggerated and stylized character would give more positive effectiveness of visual outcome because it presented some kind of surreal or fantasy visual outcome which he thought would create some curiosity and impact to the audience.

Analysis:

Through the understanding of real industry practices which based on above statements of five study participants, the effort in creating exaggerated and stylized CGI character is somehow extremely required to bring effectiveness to visual outcome in any platform of presentation. The exaggerated and stylized character would give more appealing and charismatic visual outcome compared with the character of realistic portrayal. In the practice of exaggeration, some dominant features of character were emphasized into extremities intentionally to attract people's attention. It would be presenting some kind of surreal or fantasy visual outcome which creates some curiosity and impact to people. According to the findings, the CGI character visualization practices in current industry revealed the failure of exact imitation of reality to achieve a positive result in engaging people's interest. People would be getting bored with the representation of realism and they wanted to see something beyond the imagination which

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stimulate their curiosity. In fact, so much creativities could be extended by the artists into surreal world.

Therefore, the analysis determined that exaggeration and stylization in CGI characters would bring great effectiveness for visual outcome. Through the understanding of this analysis, the researcher created a visual diagram on figure 4.3 in order to give a clearer description about the study.

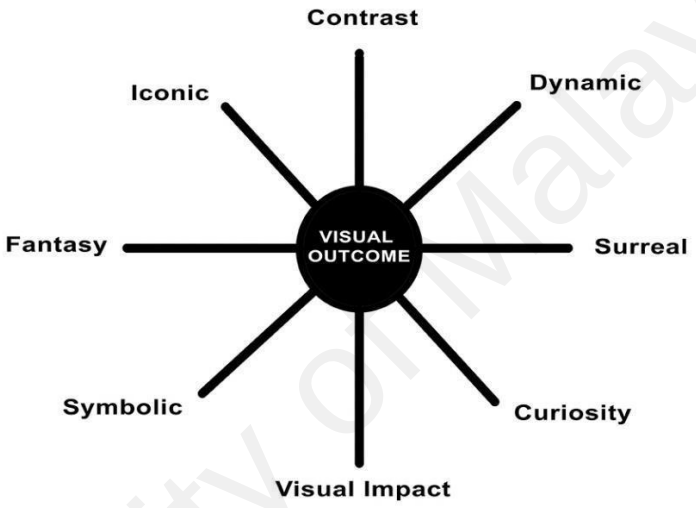

Figure 4.3: Visual outcome in CGI character exaggeration and stylization

4.5 Relevance of shapes and proportions in designing character

Respondent 1 explained well in details on the relevance of shapes and proportions in reflecting character personality traits. When designing a character, he stressed that the starting point would give a focus on the silhouette design of character as the basic in 2D drawing. According to him, this silhouette design is formed by a basic primary geometrical shape such as square, rectangle, triangle, oval or circle. All the basic shapes would influence the characteristic sense. Respondent 1 gave an example of a warrior character with heroic personality. According to him, the basic silhouette design of a warrior character should be more relevant to rectangular or triangular shape to suggest the

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broad shoulder and chest. He believes that this visual outcome would appear more iconic and simple in form. Respondent 1 also explained that proportions actually are not a standalone visual attribute apart from shapes. It should be considered to determine the portions of the character shape which to be exaggerated. He elaborated further that artists normally will divide a character into four portions which are head, chest, hip and leg. He explained that if the character has heroic personality to portray warrior, then the portion of chest is where to be exaggerated, by making it into larger in scale according to rectangular or triangular shape.

With regards to this matter, respondent 2 also shared his knowledge when he explained that a stylized character would project more recognizable silhouette shape which would reflect a certain characteristic. He also highlighted the silhouette shape as mentioned earlier by respondent 1. He explained that the silhouette shape would be constructed with basic primary shapes such as circle, square, rectangular, triangular or oval according to certain attempted proportion. Respondent 2 gave a general explanation with an example of triangular shape which always be associated with mysterious or evil characteristic. Therefore, he believes that, Darth Vader character still stays strong with the projection of basic triangular silhouette shape. At fundamental, it would really support the character personality traits.

According to experience of respondent 3, when implementing exaggeration principle, he would give first emphasis on creating the silhouette shape of character. After determining basic silhouette shape design, he also suggested to decide character proportion by dividing into few portions within that basic silhouette shape design, which commonly breaks down into head, chest, hip and leg. He further explained that the character proportioning process is the stage to determine the specifically portions of the body and facial to be appeared dominant. In this situation, dominant features are meant to be exaggerated.

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Respondent 4 also have a same explanation when he described that shapes and proportions of the character are the visual attributes that determine the basic appearance of character. According to him, the character is basically could be constructed with any simple geometrical shapes (square, rectangular, circle, oval or triangular shape) as a base structure of foundation. He stressed that the simplified form of character shape would give a clearer characteristic. While discussing about the character proportion, he explained that proportion of character would be manipulated to create a specific part of emphasis. For instance, some artist may exaggerate the head bigger to allow the emphasis to facial expression.

Respondent 5 also gave his explanation by referring to the cartoon character on TV. He said that it is so common to see a cartoon character with big head and big hands. The character was designed such a way to allow facial expression on the big head and gesture of the big hands could be seen clearly by the audiences on the screen. However, he explained that it is up to an artist to decide how to manipulate the character's shape and proportion based on the character personality traits.

Analysis:

Based on the above information from five study participants, the analysis revealed the facts that character designing process should be critically focused on the character's form generation. The construction of character's form would be based on the silhouette design of character which determined by two main visual attributes (shape and proportions). The two visual attributes should be used as an initial method for defining the basic character structure. All the study participants expressed a same opinion by saying that shape and proportions become the effective tool for developing character recognition, specifically in clarity of certain personality trait. Besides shape and proportions, the participants also gave a further linkage to the necessity of physical attributes on the character in order to give more detailing to the character's physical

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appearance.

The descriptions about the shape, proportions and physical attributes are stated as below:

1. Shape

When referring to silhouette design that mentioned by study participants, it explained the overall shape appearance which becomes the first visual cue that differentiates one character from another. Furthermore, it gives substantial information about the character personality trait in the story. Shape, with combination of proportions and physical attributes, provide the recognizable silhouette design which benefits to the identification of character.

2. Proportions

The body proportions are determined by the relationship between the portion of the body and the portion of the head of the character. The body proportions influence how the character is understood by the viewer. The manipulation of these relationships through exaggeration principle influences the stylization of character and reflects a clear hint to the character's demographic information.

3. Physical Attributes

The physical attributes relate to the detailing and physicality of the character. The physical attributes enhance the character design process by giving the appropriate details to the character to make it convincing. From facial features to costume the character would wear. It also includes all types of visual elements for presenting these details, such as texture, accessories, and etc.

The analysis revealed that a majority of the study participants have same common way of practice in establishing character personality according to the needs of that story. Therefore, before executing character design process, the source of information concerning on *story constraints* and respective *character profile* must be sufficiently

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gathered.

The descriptions about *story constraints* and *character profile* are stated as following:

1. Story Constraints

Story constraints are useful way to map this information. Story constraints are the information about aspects of the story and the overall project, which influence the character stylization the design.

2. Character profile

Character profile is the important source of information for the character. It gives a biography of the character that would be playing a role in the story. This would allow artist to visualize character based on detail information about the personality or past experiences in the character design that makes it more believable for the viewers.

The above analysis described the relationships between the source of information and the visual attributes of the design based on the artist's creativity and objectives of the project. In order to facilitate the analysis towards the relevance of shapes, proportions and physical attributes in designing character, the researcher made an effort to organize a matrix system which expected to be useful for the artist in establishing these relationships and defining parameters (Table 4.1).

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Table 4.1: The Matric System

	Story Constraints	Character Profile
Shapes		
Proportions		
Physical Attributes		

4.6 Relationship of Exaggeration principle with Staging, Solid Drawing and Appeal principles.

In responding to this matter, respondent 1 explained that exaggeration, staging, solid drawing and appeal principles are closely related to each other. He described that staging principle is used to look into the composition and the placement of the character on the layout. According to him, staging tells the gesture of character with more readable shapes. The shapes of character are exaggerated in purpose to enhance the body language of character. He also explained that solid drawing/solid design principle is used to understand how the character's form could be exaggerated in three-dimensional space. For principle of appeal, he explained that the character must look unique and outstanding to engage visual attraction to audience.

On this matter, respondent 2 also expressed a same understanding with respondent 1. He said that exaggeration, staging, solid drawing and appeal principles are in fact interrelated when these principles are applied to a character. According to him, when creating stylized character, exaggeration principle particularly must be implemented by taking some consideration to analyze along with staging, solid drawing and appeal principles. In another way of saying, the visualization of exaggerated CGI character was judged by how effective staging (the layout placement or composition), solid drawing (weight and mass in three-dimensional space) and appeal (charismatic of personality)

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were applied.

Respondent 3 gave some good elaboration in explaining how staging, solid drawing and appeal principles be related to exaggeration principle based on his practice in CGI character visualization. Particularly, when applying exaggeration to a character, he commonly would ensure that the character is staged with much more recognizable body language. He assumed this as the principle of staging. According to him, along with staging principle, the design of silhouette character's shape practically involved exaggeration to enhance dynamic visual composition and layout. For solid drawing principle, he explained that every character would present specific weight and mass that suited the character personality. He said that this could be further explained when applying exaggeration to a huge giant character for instance, more extremities on weight and mass to be emphasized in reflecting the heaviness and gigantic size of character. Following up, he also described about appeal principle which he assumed as responsive result that obtained from audiences. He explained that appeal principle would be determining whether the character could able to sustain the audience's interest by presenting an outstanding appearance and personality.

A brief description was obtained from respondent 4 in explaining to this matter. He described staging as the representation of character posture in certain composition or layout setting. For instance, to reflect more energetic character personality, certain dynamic view of character posture is purposely distorted. When describing about solid drawing, he defined it as the representation of character volume in three-dimensional space. According to him, weight and mass of character are exaggerated in order to suggest unique characteristic in reflecting certain personality. Followed up by that, he also described appeal principle as the capability of character to attract viewer by some interesting personality.

Respondent 5 also shared some similar view on this matter. According to his

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understanding, while applying exaggeration to a character, staging principle could be seen relevant when the shape of the character was exaggerated to give a clearer body gesture. In order to look into the relationship with solid Drawing principle, he explained that the weight and mass of character were exaggerated to give specific outstanding features on character's volume. As the result, he explained that Appeal principle would come into the picture only when character could able to engage the audience's interest.

Analysis:

The above information revealed the facts that exaggeration, staging, solid drawing and appeal principles are closely related to each other in process of character design development. When creating stylized character, exaggeration principle particularly must be implemented by taking some consideration to analyze along with staging, solid drawing and appeal principles. The visualization of exaggerated CGI character was judged by how effective staging (the layout placement or composition), solid drawing (weight and mass in three-dimensional space) and appeal (charismatic of personality) were applied to the character as a mission to engage the audience's interest by presenting an outstanding visual appearance and personality.

As looking into exaggeration principle in staging, the character is purposely staged with dynamic visual composition and layout to enhance the character's gesture. For solid drawing principle, every character would present specific weight and mass that suited the character personality. In the practice of exaggeration in solid drawing principle, more extremities on weight and mass are applied to reflect the special physical trait of character. Appeal principle is assumed as responsive result that obtained from audiences in determining whether the character has ability to attract viewer with some interesting personality.

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4.7 Expressive Quality: Achievement qualities in CGI character visualization.

With regards to this matter, respondent 1 shared his opinion by defining the word 'Expressive' as the ability to convey thought and feeling. He believes that in the context of CGI character visualization, the appearance of the character should have ability to express the clearer essence of personality and the state of emotion by looking through its attire, body language and facial expression.

According to respondent 2, CGI character visualization would need to achieve qualities of believability. He said that CGI character creation with certain stylization or exaggeration is just the artistic expression way of artist's vision or perspective toward the character personality in order to engage audiences. In another way of his explanation, at the end of the mission, the artist must make the audiences to believe that there is existence of life within the exaggerated character. Respondent 2 also stressed that the presented CGI character must be expressing the truthfulness of character with specific own detail of behavior, thinking, emotional feeling, desire and goal. Therefore, in his opinion, as to stimulate the emotional response from audiences, the qualities of believability should be taken into account.

Respondent 3 gave almost a same explanation with respondent 1 when he explained the 'Expressive' quality that could look into ability to convey message in clarifying certain thought and feeling. According to his explanation, the visual presentation of CGI character should have qualities that able to touch the audiences' feeling with specific emotional response in order to relate them to character's thinking and feeling. He said that audience would have to be emotionally feel empathy with the character before falling in love or interest to the character.

When responding to this matter, respondent 4 also shared some thought about the quality of believability which stressed by respondent 2. He said that audience would deeply fall into certain state of emotion and thought when a presented character achieved

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believability. Believability of character would bring more connection to the audience. In order to touch people's emotion and thought, it is important to gain the trust from people on the existence of life in the character.

Respondent 5 also shared his understanding towards 'Expressive' quality in CGI character visualization. He said that 'Expressive' quality in this context could be explained as the ability of character to be able to stimulate audience's feeling. He thought that, in order to engage the audience's attention, character should have a quality in creating strong emotional impact to the audience.

Analysis:

In the context of CGI character visualization, 'Expressive' quality was defined as ability of character to convey message in clarifying certain thought and feeling. According to the researcher's understanding from the data analysis, the visual presentation of CGI character should have qualities that able to touch the viewer's feeling with specific emotional response in order to relate them to character's thinking and feeling. Viewer would have to be emotionally feel empathy with the character before falling in love or interest to the character.

CGI character visualization would need to achieve qualities of believability. CGI character creation with certain stylization or exaggeration is the artistic expression way of artist's vision or perspective toward the character personality in order to engage viewer's interest. At the end of the mission, the artist must make the viewers to believe the existence of life in the created characters.

As looking into the context of CGI character visualization, 'Expressive' quality could be visually described with assistance of a simple visual diagram created by the researcher on Figure 4.4.

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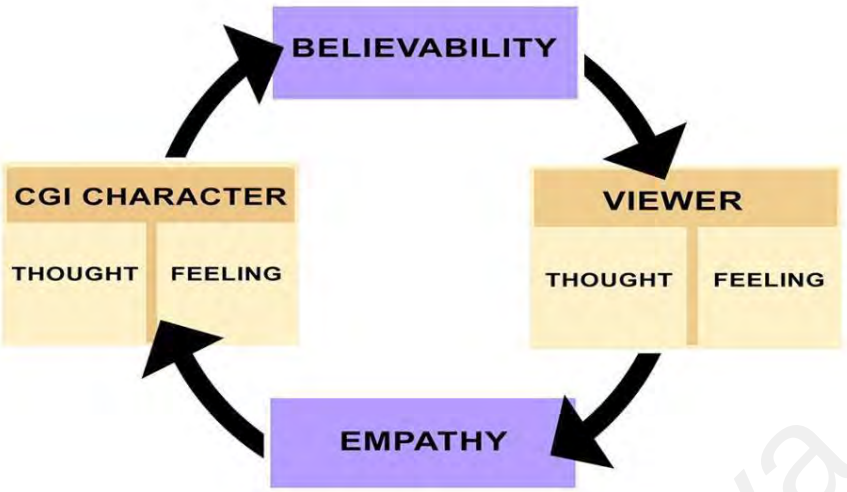

Figure 4.4: 'Expressive' quality in CGI character visualization

4.8 Visual experiment of Panglima Bukit Sadok CGI character

In this section, the researcher attempted to give emphasis on the practical experiment of Panglima Bukit Sadok CGI character which was done by the researcher in 2013. This practical visual experiment was brought back as one of a research interview issue to be questioned. In this case, the responses of study participants (CGI expects) are important to ensure the genuine interpretation towards the visual experiment. The study participants would be giving recommendations for refinement approaches to the character. The researcher believes that the beneficial inputs from study participants would be useful for future visual enhancement of Panglima Bukit Sadok CGI character.

4.8.1 The interpretation

Respondent 1 interpreted his view towards this visual experiment by describing the CGI character that able to create portrayal of one particular warrior from a tribe but unfortunately it does not really give a clear expression to suggest certain state of emotion that this warrior should has even he could see there are some attempted exaggeration

especially on facial part. As the body part, he expressed his concern about the symmetrical character's body posture which hardly to show what significant body language that to be conveyed to people. He said that the character failed to show strong personality that to fit the certain character trait.

Based on the overview interpretation of respondent 2, even though at one point, the CGI character of Panglima Bukit Sadok managed to portray the basic profile as a warrior, but however at another point he found that it is still lack of extremities that could be emphasized on the body structure, especially in the aspect on proportion. Through his observation, the character body was structured with much toward normal proportion alike real human being. In his opinion, if the character is to be stylized, exaggerate it into much more extreme to capture audiences' interest.

Respondent 3 also expressed a same opinion when he said that this experimental CGI character is lacked of specific iconic pose that may help to support the character identification. He could interpret the character as a portrayal of warrior in a tribe. However, he thought that the character still lacked of some extremities in expressing the courage and determination trait of personality that should have in Panglima Bukit Sadok CGI character. He said, the character was exaggerated particularly at some facial part, however the body parts appear too much closer to realism, observing in the aspect of proportion. He also mentioned the facts that in certain extent, the realistic features would easily open a risks of criticism from people due to the issue of any subtle imperfection that presented on CGI character. He also added that without a proper texture of skins and tattoos, the character could not able to reveal his status and rank information to audience.

According to interpretation of respondent 4, this CGI character basically presented a good anatomical form. However, the character as a portrayal of Iban warrior has no tattoos on the body to give indication of specific relevant tribe. He also commented that the head and facial parts were exaggerated for certain stylization but the body proportion

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is structured more toward realism portrayal.

Respondent 5 described this experimental character as the representation of a warrior in a tribe but he could not able to perceive which specific tribe the character belongs to. He said, the character has no specific tribal motifs for the detailing on the body. According to him, the character was designed with limited exaggeration features that emphasized on the facial and head structures. He also described well-built of character body according to anatomical structure which more likely into real human proportion.

Analysis:

The experimental CGI character of Panglima Bukit Sadok is lacked of specific iconic pose that might help to support the character identification. The character could be interpreted by all the study participants as a portrayal of warrior in a tribe. However, the character still lacked of some extremities in expressing the courage and determination trait of personality that a great warrior should has. The symmetrical character's body posture which hardly to show what significant body language that to be conveyed to people. The exaggeration of character was emphasized particularly at facial structure, however the body parts appeared too much closer to realism, particularly in the aspect of body proportion. In fact, the realistic features would easily open a risks to criticism from people if due to the issue of any subtle imperfection that presented on CGI character. The character is lacked of physical attributes (a proper texture of skins and tattoos) which could give more detailing to the character physical appearance in revealing his status and rank information to viewers.

4.8.2 Refinement Approaches

Through the interpretation from all the study participants, the researcher had taken the great opportunity to gain various comments which followed by recommendations for the refinement approach. All the study participants expressed their concern to the

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visual experiment of Panglima Bukit Sadok CGI character by giving some helpful suggestions for the refinement of this creation.

In responding to the visual experiment of Panglima Bukit Sadok CGI character, respondent 1 recommended that the refinement should be done on the basic form of the character. He suggested to give more iconic form to the character. According to him, the form could be constructed with simple shapes. He suggested to give priority in studying the use of simple geometrical shapes or volumes characteristic to reflect character traits. In this case, he described, since the Panglima Bukit Sadok character was a warrior who lived in the deep jungle, he gave suggestion to refine the body of this character by exaggerating the upper body such as chest to make it looks bulkier in size. According to his explanation, the warrior character should be looks tougher enough to survive in the tropical rain forest. He also would suggest to exaggerate the character's both arms into bigger and longer in size to adapt with such geographical environment.

In order to enhance the character identification, respondent 2 thought that Panglima Bukit Sadok CGI character needs to be considered with more detailing elements such as wound effect for a warrior, bump mapping with some of the textures on the body part, face, and head. According to his explanation, those wounds and tattoos are meant to support with hints of the history, the past and the story of Panglima Bukit Sadok in carrying stronger personality and characteristic. He described, 'visual says more than thousand words.' He believes with those supporting elements on body and facial, character can be looked more outstanding.

For refinement quality, respondent 3 suggested the CGI character of Panglima Bukit Sadok to be designed with a more iconic structural body based on one common cultural symbolic of Iban since the character is to portray Iban warrior. According to him, design elements as such character's body shapes and volumes are necessarily to give emphasis in reflecting specific cultural symbolic. For instance, the Disney's Hercules character was

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designed based on Greece cultural identity. Therefore, spiral structural line elements were obviously looked so symbolic to identity of Greece could be seen on Hercules's character design. Apart from that, he stressed that character must be presented more convincing textures with identical scar on the skin and significant tribal motifs of Iban tattoos. He also suggested character's facial to be expressed with more extreme in conveying his courage and determination personality to enhance the character identification.

Respondent 4 also gave a similar opinion when saying that CGI character of Panglima Bukit Sadok should have created a clearer significant feature to indicate Iban warrior. He explained that, since this experimental character is a warrior, he would suggest to add in cuts and bruises or old scars and wounds on the character to enhance the personality. For exaggeration, he suggested character's body to be built much bulkier and bigger with more recognizable shape and volume.

Respondent 5 expressed his opinion by suggesting to make a challenge in giving more simplicity to the character's shape and volume which would indicate one special identity. According to his explanation, the design of the body shape and volume could be based on tribal motifs of Iban or some other unique visual elements that could be found in Iban culture. Besides, he also recommended to add some tribal tattoos on the character body to represent status of that character in his community.

Analysis:

For enhancement of character identification, CGI character of Panglima Bukit Sadok should be designed with a more iconic structural body based on one common cultural symbolic of Iban since the character is to portray Iban warrior. Design elements as such character's body shapes and volumes are necessarily should be given emphasis in reflecting specific cultural symbolic. It could be based on tribal motifs of Iban or some other unique visual elements that could be found in Iban culture. For exaggeration, character's body to be built much bulkier and bigger to be looked tougher as to portray the

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greatness of warrior. Character's facial to be expressed with more extremity in conveying the courage and determined personality in order to enhance the character identification.

Panglima Bukit Sadok CGI character needs to be considered with more physical attributes that give detailing such as scar or wound effect for a warrior, bump mapping with some of the textures on the body part, face, and head. Those wounds and tribal tattoos are meant to support with hints of the history, the past and the story of Panglima Bukit Sadok in carrying stronger personality and characteristic.

4.9 Summary

The chapter explained with all the results obtained from the study participant interviews and this gathered data was analyzed to be the useful findings, approaching for further establishment of CGI character visualization process framework.

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CHAPTER 5: FINDINGS, IMPLICATIONS AND RECOMMENDATIONS

5.1 Findings

The findings of the research showed a comprehensive documentation and in-depth understanding result towards the implementation of exaggeration principle in CGI character visualization. In fact, all the findings were genuinely based on comparative data which analyzed from five CGI industry experts. The findings indicated the CGI character visualization process requires a great effort of artist in conducting complex concept development and design execution. In more specific way of saying, the findings highlighted the implementation of exaggeration principle in CGI character visualization process, its relationship with others related components of animation principles and the expressive quality that expected to be achieved. As what it had been discussed earlier in Chapter four, the analysis indicated the relationships between the source of information and the visual attributes of the design based on the artist's creativity and objectives of the project. In fact, the findings revealed the relevance of visual attributes such as shapes, proportions and physical attributes in CGI character visualization were recommended by most study participants. All those relevant visual attributes were suggested to be taken into account when implementing exaggeration principle. This useful information also led the fact that exaggeration principle is meant to be evaluated with staging, solid design and appeal principle. Indeed, those principles are meant to determine the organization of visual attributes. Someway, the findings revealed the relationship of exaggeration principle with other components of principles. Therefore, the research findings already explained what had been stated by John Lesseter about the implementation of exaggeration principle. It is absolutely fair to say that exaggeration is not the standalone principle and to be implemented with other components of principles. The obtained findings became a great approach for the researcher to bring his understanding result into a clearer picture. In fact, the findings had opened to the

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possibility in establishing well-organized structure of framework, as a systematic guide to the process of designing CGI character.

5.1.1 The framework of CGI character visualization process

The Framework of CGI Character Visualization Process is a helpful guide for CGI artists to understand what the ideal steps and structural work flow that involve in creating a good CGI character. It leads a great start of direction while conducting the process, by describing the rationale behind each step. The framework is a planning and organizing work flow that visualized by researcher into diagram as an intention to give a better picture in understanding how the whole process of exaggeration principle being implemented. In fact, the complexity of interrelated steps, aspects and principles that mentioned in the chapter 4, under the data analysis were illustrated into the simplified diagram in order to assist the understanding of CG artists toward this process.

The framework was developed according to the information that obtained from five respondents. The researcher analyzed the data and took up an effort in connecting all the sources into a proper establishment of framework. Through the research findings, the researcher could see the importance of good organization when looking into CGI character visualization process as a useful guide for self-learning knowledge. Previously, the researcher did not have a comprehensive understanding of the whole process of CGI character visualization when creating Panglima Bukit Sadok CGI character in 2013. In fact, the existing Panglima Bukit Sadok CGI character was created without any guide of framework. Thus, the systematic approach for the development of the framework was supposed to overcome this lack of guide for this knowledge. The researcher intends to use this framework as a systematic guide to generate a second creation of Panglima Bukit Sadok CGI character as the future approach for refinement.

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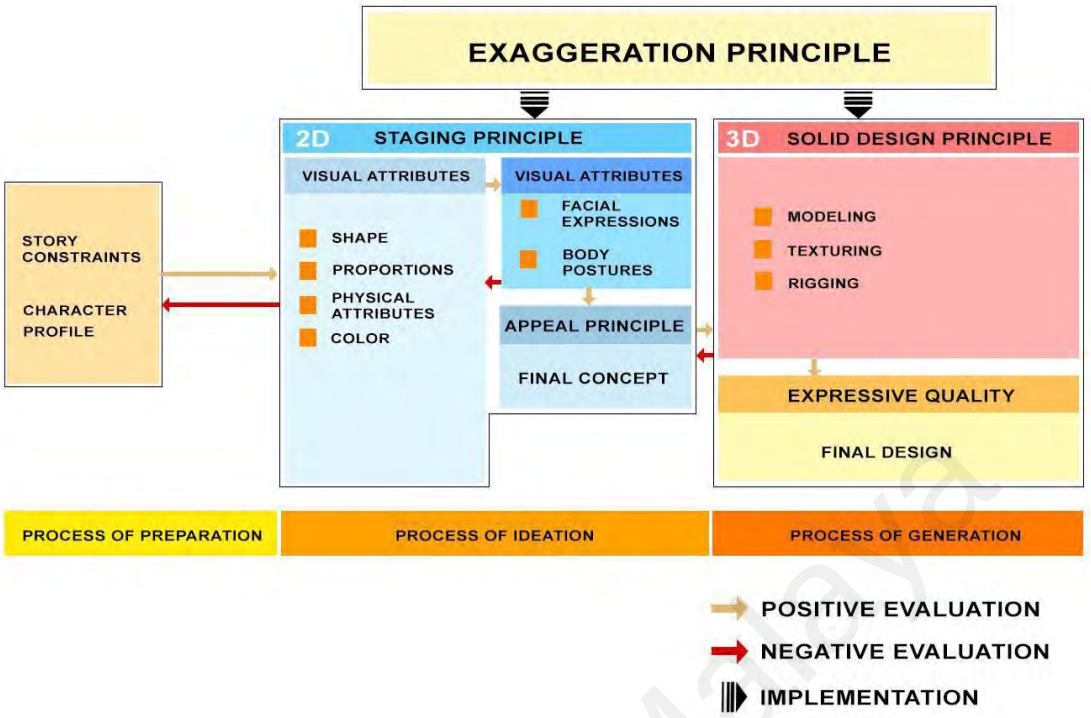

Figure 5.1: The Framework of CGI Character Visualization Process

The framework of CGI character visualization process which illustrated in the form of visual diagram on figure 5.1 is a good reference tool that meant to aid the problem resolving process that involved the concept development and design work execution of CGI character especially when dealing with a project as such CGI character visualization of Panglima Bukit Sadok. Basically, the process of problem resolving was divided into three sections in this framework, which could be called as: process of preparation, process of ideation and process of generation.

1. Process of preparation:

At this preparation stage, the story and character profile are studied and gathered from any possibly sources of information. It is suggested that to create a socially accepted character in the aspect of believability, Panglima Bukit Sadok character should be portrayed a personality with 'a history of past experiences.' The establishment of Panglima Bukit Sadok personality have to be based on the historical events he experienced through; the place and location he lived in; the community and society he used to communicate with and the role he

played in that community. Thus, the sufficient studies into the cultural elements of Iban warrior at that specific timeframe should be carried on. With the coverage of all these initial studies, Character profile of Panglima Bukit Sadok could be further developed. It is an important information that provides the necessarily sources for the next concept development stage.

2. Process of ideation:

This is a conceptualizing stage, where the basic 2D form of Panglima Bukit Sadok character is designed by applying fundamental visual attributes as such shape, proportions, physical attributes and color. At this point, Exaggeration principle is implemented to obtain some extremities on the facial and body of PBS character, emphasizing the Staging principle of the character features. Facial expression and body postures are the two main features to be evaluated in getting a good Staging principle. The evaluation of final concept to be reviewed through Appeal principle which looked into charismatic visual concept that applied in the Panglima Bukit Sadok character.

3. Process of generation:

At the stage of execution, the good evaluated final concept is brought to the following 3D building process where modeling, texturing and rigging are executed. This is the stage where the final design in the form of CGI is evaluated through Solid Design principle. Expressive quality is the final result that attempted to be achieved in this framework.

This framework serves as a reference for CGI artists in regards to the practical application and further studies of CGI character visualization. This framework is developed to aid the problem resolving process of Panglima Bukit Sadok CGI character visualization project. Although every project might deal with different set of problems, the basic way of triggering the problems in aspects of interrelated steps, visual attributes and principles are still relevant in any process of CGI character visualization. By analyzing this framework,

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CGI artists will be able use it as a reference for future problem or practical project.

5.2 Implications and recommendations

This research was aimed to develop appropriate framework based on the source of studies from the experts in the industry of CGI character visualization. The framework of CGI character visualization process is meant to generalize the guide for any CGI character visualization project which does not limit only for Panglima Bukit Sadok project. Ultimately, the research result serves as references for any CGI artists in regards to the practical application and further understanding of exaggeration principle in CGI character visualization. As mentioned previously, although the issues in CGI character visualization might be different in every project, the body of knowledge established in the framework serves as a useful guide to be explored. The research offers a great supplementary knowledge in supporting CGI character visualization course in local higher institutions.

However, the proposed framework must be challenged with practical test in order to prove the value of its functionality towards the practical outcome. Thus, this will become great challenge for the researcher to employ the framework as a guide for him to generate second version of Panglima Bukit Sadok CGI character. This research addressed the importance of exaggeration principle as the key towards a great stylization of character. Hassan Mutalib (2008) described that there is no distinctive character styling in Malaysia that can be considered unique or having a local identity. Thus, it would be interesting challenge to give in-depth focus on how multi-culture is portrayed in Malaysian character. Besides, the character study could be broadened the scope into animation instead of still visualization. Through the character animation study, the further exploration to be focusing on temporal dynamic, such as motion stylization, timing and contingency during the interaction.

5.3 Summary

In summary, the researcher believes that his study offers a comprehensive

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documentation, knowledge and insights for the visualization of CGI characters, and provides a set of frameworks which is not only applicable for Panglima Bukit Sadok, but also become a useful guide for any practitioners and inspires future research on the development of local CGI character visualization or animation.

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APPENDICES

APPENDIX A: Consent Form

TO WHOM IN MAY CONCERN

Dear sir/ Madam,

CONSENT TO BECOME A PARTICIPANT IN THE RESEARCH STUDY

The research is entitled "Exaggeration principle for CGI character visualization: A framework for Panglima Bukit Sadok". This is being carried out to elicit information from participants on the implementation of Exaggeration principle in CGI character visualization based on their experiences in CGI industry. The participants are expected to provide their opinions which become the useful data for the Panglima Bukit Sadok CGI character development.

All participants are at liberty to choose a convenient time for the interview. This study is to fulfil an academic requirement, therefore all information provided will remain confidential, and anonymous. Your consent is needed to enable the researcher carry on with this research.

I agree to be a participant in the research and consent to be interviewed as well as be audio-recorded. I have read the information letter and agreed to the terms of participating in the research.

Signed (Research Participant): _____

Date: _____

Email address: _____

Signed (Researcher): _____

Date: _____

Email address: kiangkuan@yahoo.com

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APPENDIX B: Sample of interview transcription

Transcription of interview with Respondent 3

Researcher: Many creation of CGI characters is intentionally exaggerated: Can you please define what makes the exaggeration so **important** for CGI character visualization?

Respondent 3: The exaggeration is very important for CGI character visualization. It is a great privilege of today's CGI visualization and animation; a designed character could be easily exaggerated to get the uniqueness of style. In fact, I have been struggling to create a significant style that could reflect Bangladeshi animation, particularly in the scope of character design development. The exaggeration as key approach into stylization of reality. He emphasized that exaggeration is the main principle that he would take into consideration when designing a style of character based on reality.

Researcher: To support the character posture and emotion: Can you please justify, the **significant roles** of exaggeration principle?

Respondent 3: The significant role of exaggeration principle is to capture the essence of gesture or emotion based on the reality and express it to the audience in a clear and understandable way. Therefore, this becomes the main reason why the CG artists prefer to give emphasis on creating the caricature of body posture and facial expression, as the best way to portray the character's special traits. Besides that, a clearer portrayal of

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character's identification through exaggeration would have a strong advantage to reflect specific essence of cultural identity.

Researcher: Exaggeration and styling in CGI character is extremely required: Can you please determine, what are the **effectiveness** on visual outcome?

Respondent 3: Exaggerated and stylized character has more charisma compared with realistic character. Character with charisma would stimulate the emotional response from audiences. For instance, in exaggeration principle, a fat man will be presented much fatter by expressing his extremities in weight and mass. Pushing the extremities of a design helps to capture that essence and creates a stronger impact with the audience. In fact, the extremities on character's appearance also convey a clearer emotional state for audiences to feel empathy with certain situation.

Researcher: Particularly, when implementing exaggeration principle, shapes and proportions are required to be considered in designing character personality traits: How do shapes and proportions be **relevant** to this matters?

Respondent 3: When implementing exaggeration principle, the first emphasis would be on determining the silhouette shape design of character. This silhouette shape design could be in square, rectangle, triangle, oval or circle. Each of those shapes suggest a visual characteristic. For a simple example, if I would design an attractive lady character to show

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femininity, then the basic silhouette shape design of the character would be involved two oval shapes that intersecting up and down to form a vase alike shape. After determining basic silhouette shape design, I also would have to decide character proportion by dividing into few portions within that basic silhouette shape design, which commonly breaks down into head, chest, hip and leg. Character proportioning process is the part where I would decide which portions of the body and facial to be appeared dominant. In this case, dominant features are meant to be exaggerated.

Researcher: Exaggeration principle is not meant to be standalone animation principle. However, it should be implemented with the consideration of Staging, Solid drawing and Appeal principles: Can you please clarify what are the **relationship** of those principles in supporting the exaggerated character personality?

Respondent 3: Exaggeration, Staging, Solid Drawing and Appeal principles are commonly discussed in animation production. Particularly, when we apply exaggeration to a character, we need to ensure that the character is staged with much more recognizable body language. This is what we called the principle of Staging. Along with Staging principle, the design of silhouette character's shape practically involved exaggeration to enhance dynamic visual composition and layout. In Solid Drawing principle, every characters would present specific weight and mass that suited the character personality. This could be explained when we apply exaggeration to a huge giant character, more

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extremities on weight and mass to be emphasized in reflecting the heaviness and gigantic size of character. Following up, Appeal principle is very much to do with the responsive result that obtained from audiences. This principle would be determining whether the character could able to sustain the audience's interest by presenting an outstanding appearance and personality.

Researcher: (Expressive quality) is needed to be achieved in CGI character visualization: From your field experience and understanding, what are the **qualities** need to be achieved?

Respondent 3: In my own view, the expressive could look into capability to convey message in clarifying certain thought and feeling. In this context of CGI character visualization, the visual presentation of character should have qualities that able to touch the audiences' feeling with specific emotional response in order to relate them to character's thinking and feeling. To be fall in love or interest to a character, audiences would have to be emotionally feel empathy with the character.

Researcher: For this question, I need you to observe the visual on **Figure 3.1**. From this visual presentation, what is your overview **interpretation** about the visual CGI character?

Respondent 3: Base on my observation, this CGI character is lacked of specific iconic posture that may help to support the character identification. The

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character is a portrayal of brave warrior in a tribe. Therefore, I think that character still lacked of some extremities in expressing the courage and determination trait of personality in Panglima Bukit Sadok CGI character. The character was exaggerated particularly at some facial part; however, the body parts is still too much closer to realism in the aspect of proportion. For some extent, the realistic features would open to a risk of criticism from people due to the issue of subtle imperfection that presented on CGI character. Without a proper texture of skins and tattoos, the character could not able to reveal his status and rank information to audience.

Researcher: After review and interpret the presentation, what can you suggest on the applicable approach for **refinement** quality?

Respondent 3: For refinement quality, I would suggest that the CGI character of Panglima Bukit Sadok should have designed a more iconic structural body based on one common cultural symbolic of Iban since the character is to portray Iban warrior. Design elements as such character's body shapes and volumes are necessarily needed to give emphasis in reflecting specific cultural symbolic. For instance, the Disney's Hercules character was designed based on Greece cultural identity. Therefore, spiral structural line elements were obviously looked so symbolic to identity of Greece could be seen on Hercules's character design. Apart from that, the character must be presented more convincing textures with identical scar on the skin and significant tribal motifs of Iban tattoos. Character's facial should be expressed with more

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extreme in conveying his courage and determination personality to enhance the character identification.

Researcher: Apart from the entire inquiries in this interview session, is there any **additional relevance** statement that you would like to explain?

Respondent 3: For additional relevance statement, I think the color of the character design also could be made a certain exaggeration by applying colors that might beyond from the reality because sometimes extremities applied to color have more supportive identification. A specific color reflects a specific symbolic meaning for specific cultural identity.

Researcher: Well, thank you for your assistance. I am very sure that I have obtained a lot of informative source from you. Your precious time that you have given to me is very much appreciated. Thank you and see you again in future.

Respondent 3: No problem at all. You are very much welcomed.

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