IJDMD

Contents

International Journal of Digital Media Design ／ Volume 4 ／ Number 1 ／December 2012

ISSN 2078-4775

Phase IV Preface by the Guest Editor

Regarding the in-charge affairs of the editor in Phase IV, the work for the succeeding editor is taken over by the secretariat because of the re-division of internal work. Submitted manuscripts and the ones invited by the edit-office are anonymously inspected for selecting the best-quality papers. Total six papers recommended by the referees are published. Great gratitude to the referees for supporting the council affairs and much appreciation of the contribution of authors, the journal is broadly developed in the professional field. It is expected that the promotion of IJDMD could contribute to design. May the council affairs of the society prosper!

Guest Editor *Shyh-Bao Chiang*
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A Study on Digital Technology Application in of China Sthetics Form

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For present purpose of communication codes on symbols are the central importance in understanding man and his communication. Esthetics is regarded as how the language pictures and voice can be communicated by using codes. This study is focusing on the collection of the important components in china esthetics form all the related theory paper and journals. Also approaching to the possibility of applying esthetics in to design. All the purpose is pursuing a new idea and a different design solution thru some theory application.

Keyword: Thinking mode, symbols, esthetics form

1. Introduction

Chinese aesthetics, influenced strongly by Daoism, Confucianism, and Buddhism, manifests a distinctive and complex view of nature. The basic assumption is that the world of phenomena manifests the *Dao*, the Way of nature. The Dao is not a separate reality but rather the patterned processes of the natural world, or perhaps the disposition of the universe to act in a patterned, harmoniously interactive way. The human ideal is to understand the Dao and act in harmony with it.

Because humans are a part of nature, human culture is not seen as something separate form nature or unnatural. This was particularly stressed in the first chapter of *The Literary Mind and the Carving of Dragons.* The term for both literature and culture is wen. Originally the term meant the pattern a phenomenon makes, e.g., the particular sound a pine makes in the wind, the colors of a tiger, the shapes of a cloud. Human culture -- literature and art in particular -- is the wen of humans. The words written by a poet are essentially no different form the tracks a bird make in sand. Culture is, thus, natural, but that naturalness is realized only if the person acts as nature does, with spontaneity according to one's true inner nature rather than based on the desires of the ego-self.

This view gives humans a paradoxical status within nature. We are the only phenomena that fail to exhibit naturalness. However, humans also are given an exalted status within nature, for if an artist creates in a natural way, then the "mind of nature" is revealed and the transformations of nature are brought to "completion." Thus we have a responsibility to act in a natural way. If we act on the basis of our personal desires or if we delude ourselves into thinking we are separate form nature, then nature's transformations cannot reach fulfillment and disharmony results.

The notion of nature at work here is different form what we are used to in the West. Although there are numerous different meanings of our word "nature," two meanings have been particularly influential. One we could call "dualistic": nature is whatever humans have not created or manipulated. The opposite of this notion of nature would be "culture" or "human," and a skyscraper or toxic waste would be considered unnatural. The second notion of nature we could call "monistic": nature is whatever exists in our world. A skyscraper or toxic waste are in this sense natural, and the "natural" sciences can study them. Here the opposite of nature would be the "supernatural." Chinese aesthetics is based on a third, "adverbial" notion of nature. As in the monistic notion of nature, humans are "essentially" a part of nature. However, existentially humans may act unnaturally if they don't act spontaneously according to their nature. The opposite of this sense of the natural is the artificial, the forced, and inevitably the

disharmonious. Thus human culture may or may not manifest the mind of nature. Essentially humans are natural, but existentially the natural is only a possibility. We must work to realize it.

2. On the Thought of Chinese Thinking

As a classical aesthetics, traditional Chinese aesthetics emphasizes the beauty of harmoniousness. This is closely related to the mutual separation and mutual taking in between Confucianism and Daoism in philosophical, moral, and aesthetic thoughts. By *I Ching* (易經) (Fig.1), an early Confucian classical text, and certain discourses of each Confucian branch in pre-Qin times, it can be seen that Confucianism lays particular stress on human, gives prominence to the initiative spirit of human, and focuses on human knowledge of the society to emphasize the unification of goodness and beauty. By certain discourses of the representative figures form *Lao zi* (老子)to *Zhuang z* (莊子)*i*, it can be seen that Daoism lays particular stress on natural

philosophy, gives prominence to the norms of nature, and focuses on human knowledge of the nature to emphasize the unification of truth and beauty. Confucianism and Daoism oppose and complement each other, and fuse into the thought of beauty of harmony(Table1).

Figure 1 I Ching (Photo origin:www.rotten.com/library/ occult/i-ching/)

Table 1. Design thinking of the unity of heaven and human

Design thinking	Content
■ Character of the Symbol-and-Number Thinking Mode	The symbol-and-number thinking mode in *I Ching* theory represents the traditional thinking mode of China. It is characterized by attaching more importance to entirety than individuality, functions than structures, the concrete than the abstract and changes in a circle than changes by means of innovation.
■ On the *Gua-qi* theory in the *Han Yi* learning form philosophical perspectives	With old learning and new creations being merged, *Gua-qi* theory (a theory elucidating the correspondence between the seasonal points and lines of the hexagrams) is a basic theory expounded. his theory manifested related *Yi* learning experts' cosmic as well as ultimate humanistic concerns, and exposed their basic idea on social life of basing on the Way of heaven to found the Way of human and emulating the former to expand latter, and partly reflected the development orbit of the academic and cultural course of the dual development and mutual complement between the humanization of theology and the theologization of humanistic at that time.
■ Analysis on the semioligic semantics	By level, the semiologic semantic meanings of the Yi can be divided into character origin and cultural semiologic semantic meanings. The former is the foundation of the latter and determines its basic trend, while the latter elevates, expands, and philosophicalize the former. Different levels of semantics simultaneously spring form the cultural semiologic semantic space of the Yi, depict the unique living world of Chinese linguistic culture, meanwhile, the producing and forming of its semantic meanings also depend on the participation of the symbols into Chinese cultural events of life.

2.1 Song Jiang decomposition matrix method in the form

This study also will use sensors to track the characteristics of Sung Chiang Battle Array and take place after formation. Song Jiang in the bursts of each type of players who stick on sensor node, the use of sensor network monitoring and tracking of objects (object monitoring and tracking) technology, placed around the room a number of roles in the sensor (MICA 2) to track the location of each sensor node. When the players each Zhenshi body sensor node begin to exercise, the role of sensors to take advantage of several issued by the other sensors known specific coordinates, and other reference points and based on their relative position and relative distance, with the positioning technology to calculate the coordinates of each sensor node (Figure 2) (Table 2).
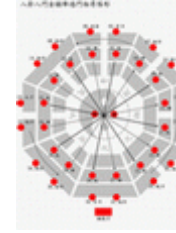
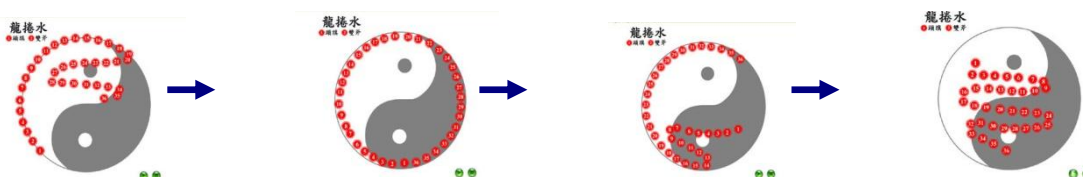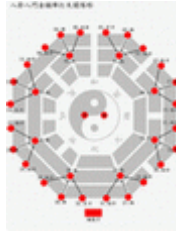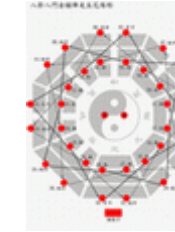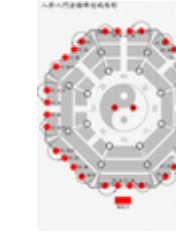**Figure 2. Song Jiang-type tornado blowing away a bitmap water simulation**

Table 2. Song Jiang exploded matrix method in the form

拜旗	發彩	拋箍	採旗作號	插角跳內外箍-坤位
倒離圈	個人兵器	穿中心	龍捲水	插角跳內外箍-坤位
蜈蚣陣-分陰陽	蜈蚣陣-蜈蚣陣	蜘蛛結網	損對	白鶴陣

白鶴陣-三行	白鶴陣-收陣	白鶴陣-損本對	白鶴陣-羅大小	空手連環
八卦陣	八卦陣-打天關	八卦陣-收箍	八卦陣-走五花	八卦陣-巡城
八卦陣-探地靈、犁頭戴鼎	八卦陣-連環對	八卦陣-過門 相尋	八卦陣-損本對	

3. Theory of China Form

If culture is the source in week form the trader of the Yellow River Basin in the development of Chinese art, on one hand the working long-term of art is regarded as the humble work in order to be conquered the work of the clan, the artistic result that works is often combined with religion, ethics on the other hand, work of art give into too much mystery flavour, situation these influence art material enthusiasm of discussion that aspect " beautiful form have " on working. These situations did not slightly change by the Tang Dynasty, but the work of art has been demanded all the time for too many morals was main shafts of artistic knowledge development thereafter, the materials that have always probed into the work of art with beautiful form are very rare. So, " principle " with beautiful form of China, all of us are deemed " principle " to explain first .

3.1 Pursue principle and level principle Jointly

Pursue to refer to and fill up the shaping element a certain limit in the designated range in principle jointly (Fig.3). Pursue to come form the division of labour cooperation of the traditional building mainly in principle jointly, such as: One piece construction work usually is large to be divide carpentery workshop into, light for carpentery workshop, the stone making, colored drawing or pattern,,,etc., and by the always responsible project that the master worker distributes every fen of " holding draft chi ", this kind of distribution is not only distribution of the project, it is the distribution of the position range too, certainly the window frame , casement of the small carpentery workshop should be " full " within the range of designated position, similarly, certainly the colored drawing or pattern in cliff side , Liang Fang should be " full " within the range of designated position too. In traditional fens of items of project of building, every is it design project of concept to have, every project of pursueing the draft homework, because will often make the component in accordance with certain size first , then show up and assemble or open up and sting and 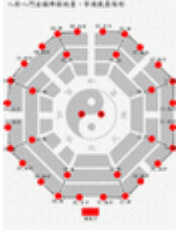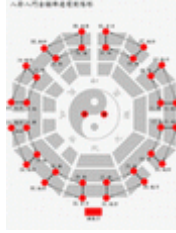show to while " appointing the range " and become the lines base map first in accordance with the picture draft of the full size, pay close attention to size , put emphasis on even that equal to the principle of pictures. Pursue to divide into the principle of cutting apart again under this great principle jointly (mean that is cut apart by a certain limit first , make up obviously apt to shut Fig. after cutting apart),

boundary principle (this is it is it cut apart principle to use to mean usually, keep this kind and cut apart or strengthen this kind to cut apart on the visual effect, this is called boundary principle) and level principle, among them there are more extensive application on the building and design with the level principle, we prove as follows alone.

Figure 3. The form of Pursue Principle

Level principle is originally meant after using principle of cutting apart, how to and then join back, a kind of principle that will just be obeyed , such as: Tactics are the level principle if pile in the traditional building colored drawing or pattern project faints, gradation zone principles somewhat like the western American principle of form of this principle, meaning and tactics of more painting one and space. Not only develop a pile of tactics of fainting in the project of the colored drawing or pattern in the traditional painting upper strata principle once, even in the composition of the picture, should be promising, the medium shot , background are thinking and tactics of the level principle, such tactics have strengthened depth of field of space and space sense in level painting too. At the time of the application of the level principle in building , go still one step further to seperate form equal to the picture principle, become and shut one of the most frequently used principles in the institute building and view of flower garden .

3.2 Principle that shut the principle of words and walk quickly and keep away

The principle wants and walks quickly and keep away the principles discuss together , this refers to the size in building level , building elevation to shut words, the total size (such as the size of picture of the colored drawing or pattern) fitted up in building should accord with the principle pursueing good fortune and avoid disater, mean too that the figure , number of figure or painting element cutting apart in picture should accord with the function pursueing good fortune and avoid disater(Fig.4). To pursue good fortune and avoid disater size, develop Lu Ban chi (door metre , door light chi or gentle metre) and blue two systems of ruler of cube in traditional building; Principle the figure or the number forming the element in order to cut apart that it is great that the the figure one pursues good fortune and avoid disater, it is lucky to regard odd number as in principle, the even number is fierce.

Walk quickly and keep away principle mean design any tactics of pursueing good fortune and avoid disater, go still one step further to say that the principle is the greatest principle of China's geomantic omen to walk quickly and keep away. Geomantic omen principle on it is detailed,we can elaboration.
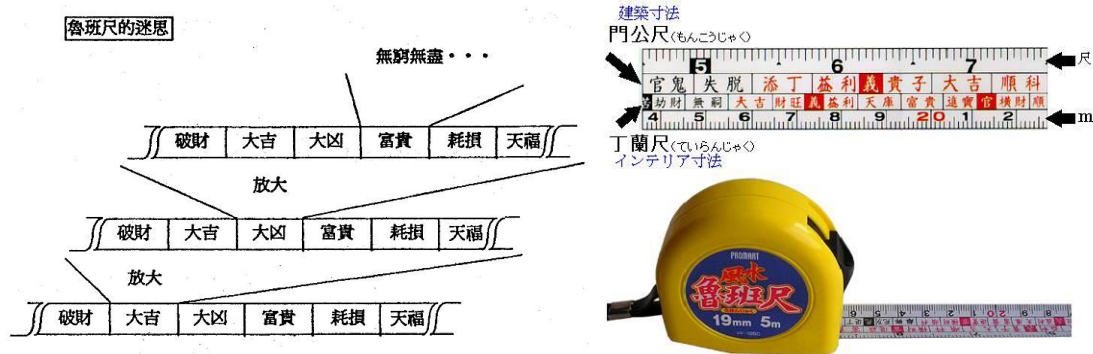
Figure 4. The form of Principle that shut the principle of words and walk quickly and keep away

(Photo origin:www.pro-shop.co.jp/ cgi-bin/item.cgi?item_id=8...)

3.3 Desirable principle and principle of suitabling

The desirable principles want and suitable for the principles and discuss together , this is the result that refer to any design works, if can accord with the will and intention of the owner , supporter or buyer , and should accord with the identities of the owner , supporter or buyer. Accord with owner , supporter , will and intention of buyer, such principle seem " sex of Taiyuan " and overly suffused with the theory. According with the identities of the owner , supporter or buyer, such a principle seems obstructed now, however, it is the important ethics norm in the traditional society.

Suitable for the principling is " the identities of the owner , supporter or buyer " in the traditional society, can explain in the modern society that " accord with the economic condition and design condition ". It is obvious,it suitable for principles to be too and not overly for " Taiyuan sex ".

We especially propose " the desirable principle " form traditional art of our country, though seem to be overly suffused with the theory , but when we weigh this desirable principle carefully, but can realize some and nowadays design commonly more used theory gradually , these theories are: The theme is said , agrees with yard and says and says to the overall arrangement. Be able to want abundant and intact expressing " the meaning " to design the works to point while saying in theme. Agree with yard and say that should adopt the symbol shaping that the owner , user know to design the works well to point. The overall arrangement says and means the design process like arranging out intact " comparable to the office" gradually, this is the principle that another one is more important too: " overall arrangement principle ", we place on the next to prove.

3.4 Overall arrangement principle

Game contract of the picture how overall arrangement principle is meant to make . The overall arrangement principle is form the aesthetic principles that is lent over of the field , such as thought , weiqi , design of garden of front yard cultivated in a pot of military commander (Fig.5),etc., mean " game contract " , " intact " that story or space can of the picture , picture mainly.

Under " overall arrangement principle ", its more detailed project has: It form home court (scene) the principles, host and guest principle, location preface principle, setting off by contrast principle of, echoing principle (of principle not dark), antithesis principle, the actual situation principle of,,etc..
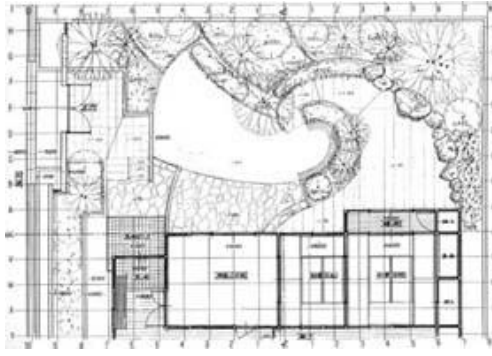
Figure 5. The form of Overall arrangement principle

3.5 Mean the principle and express the principle

Mean that the principle wants and expresses the principle and discusses together. Mean that the principle refers to and designs the works can there is deep meaning for the buyers of owner , user to " ponder " . It is usually not only satisfied " using the function " to express the principle and refer to and design the works, meet the expression of the specific theme even more.

On the traditional architectural design, " meant the principle "ing , often already standardization , and become this one of " identity which accords with the owner , supporter or buyer " in the desirable principle, even incorrectly relay an erroneous message and form the unshakable norm , is influencing and designing. Such as: Can only usually do horses and carry the shaping in the roof form of the building of local-style dwelling houses of Taiwan, only the owner makes into swallow's tail shaping till passing the the officer of scholarly honor of official rank; And the roof form of Taiwan temple building , except the extremely special reason, otherwise make into swallow's tail shaping at least. (actually look through it documents of ancient building , cannot find such a record of " can't make the roof into swallow's tail shaping till passing the the officer of scholarly honor of official ranking ", whether so in traditional society, the norm can only is it incorrectly relay an erroneous message to say, reliable explanation should it says to be. Swallow tail symbolize high power and position, horse is it symbolize low power and position to carry, reach day according to period the Former Qing Dynasty, it is all

high power and position to act the official and work as immortals, the peasant and businessman are all low power and position). Change and do the present state, if we design horses and carry the local-style dwelling houses on the roof again now, that is the expression that a kind of rank and file " symbolizes "; If we design swallow's local-style dwelling houses on the tail roof again now, that is expressions that a kind of government official's family " symbolizes ". This is to mean the principle and express the principle.

4. Conclusion

Western aesthetics is that proceeds form relations of host and guest to put forward , hold all aesthetic questions. It can only be to understand one kind of the world abstractly that so the one that pay close attention to can only be field of the certainty , field of knowledge built and constructed . This is a specific explanation frame of western aesthetics: Explain the frame in knowledge type. Though China's aesthetics is same the thinking puts emphasis on putting forward, holding all aesthetic questions differently. Therefore improve out pure freedom and build and construct a kind of inherent understanding to the life activity. This is a specific explanation frame of China's aesthetics: Intelligent explanation frame . Above-mentioned specific backgrounds and frame of explaining must bring on different thinking orientations this make western aesthetics move towards laying particular emphasis on the thinking orientation of cognition that " have ". The ones that paid close attention to the thing between the

things are the same, the indentity , universality one get to the bottom of it and ask that the bottom is its most outstanding thinking route . China's aesthetics has moved towards laying particular emphasis on the intelligent thinking orientation not " had " . Is not it that " it is assorted to an important one of China's aesthetics? " But "how? Kind ". What it pay close attention to the thing looks general character, dependence, person who melt of thing.

There is its uniqueness in China's aesthstic category: Seen form form of the symbol have alike explaining nature; Seen form logic intention have muddy melting nature; Derivative; Seeing form theory purport has functionality. This kind of " category characteristic " has shown the unique way held in Chinese nation's aesthetic thinking and art typically.

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"Watch Out Behind You!" An Animated Short Film Using Hand-drawn Illustration Techniques

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This paper describes a method for integrating hand-drawn graphic illustrations into multimedia computer animation. The approach combines old-fashioned 2D illustration methods which use hand drawn illustrations and traditional storyboarding techniques with modern animation and video software. First, a literature review traces the historical roots of illustration as a form of media. The intention is to highlight similarities and differences in the historical development of illustrations in Western and Eastern media. Modern day graphic media is almost entirely computer based, so the next section examines a case study and considers each stage of the animated movie making process in detail. A short animated movie made by college students and titled *"Watch Out Behind You!"* provides the basis of the case study. Examples of special 2D and 3D techniques are offered to demonstrate how these techniques can enhance realism and provide a sense of action in the movie. The aim of this paper is to raise awareness of the various skills required of modern animators, particularly with regard to old-fashioned 2D techniques of illustration. We hope this study will contribute to a deeper understanding of the animated movie making process.

Keyword: 2D Animation, Hand-painted Illustration, Watch Out Behind You!

1. Introduction

In animated movies, the story plot, painting style, audio, and script blend together to create a lively audio/visual experience. Although the story script is the primary factor influencing the success of an animated work, the painting style is also important because it reinforces the story and makes the performance more vivid. Painting style is what made Walt Disney cartoons so successful. Writer and designer Richard Kelsey said "My child, now you paint and later you will have the opportunity to create animation. I draw cartoons not to learn animation, but to really study painting". In other words, even in the digital age, painting is still the basic language of animation, and will almost certainly remain so in the future.

Animated productions link the images on the screen with the main storyline. Therefore, an important consideration in an animated story is the representation of feelings and emotions. Painting style can have a direct impact on how feelings are portrayed. Painting techniques help to create an atmosphere that can make it easier for viewers to visualize the narrative. Animated characters in the story or scene can be depicted in tone color to convey a certain message. Hand-painted animated characters create more vivid characters, and modern computer software can reduce the labor involved in creating animations. Computers have made the world of animation more creative, and digital illustration techniques are widely used.

Six students from the Department of Multimedia Design at National Formosa University developed the animation "Watch Out Behind You! " under the supervision of their instructor, Jue Wu-Haw. Tsai-Chun Yu, Ssu-Yu Chen, Yu-Fen Sung, Shang-Hsuan Lu, Pei-Chun Chang, and Jyun-Da Zeng developed a topic, based on the theme of a "time-traveling vampire". By combining two popular ideas from horror and science fiction, they created a stimulating background for the mystery. This paper examines the production process used to create this 2D animated short film. It is hoped that this will provide a better understanding of how new techniques can be combined with traditional 2D

animation methods.

2. Literature Review

There are many different aspects of an "illustration". The main purpose of an illustration is to present text, stories and ideas in a visually appealing way. Illustration is popular as a form of mass communication, so anything, including art-related design techniques, such as textual design, and space layout can be considered an illustration. Illustrations are used in a diverse range of media, including books, magazines, newspapers, brochures, novels, textbooks and other publications. Even the decorative insert inside the front cover, or freehand drawings within the text, are collectively referred to as illustrations. In summary, illustrations are an artistic combination of artwork and text, which help to spread an idea within a narrative. Illustrations have changed with the advent of multi-media, but they still have one thing in common, and that is that they use media to create an atmosphere and evoke some form of emotion to convey a message.

Illustration has deep historical roots dating back to the earliest prehistoric cave paintings. In the 8th century illustrations were widely used in Japanese Ukiyo-e Edo prints. In the 15th century, illustrated books and woodblock prints became a major medium for propaganda. Continuous improvements in printing technology in the 19th century have produced illustrations in newspapers, and books. In the 20th century, the art of illustration reached a golden age and engaging illustrations were created en mass. Some painters, were impacted by the abstract expressionist school of painting, and developed new forms of illustration. Then, around the 1970s, illustrations returned to a realistic style.

The development of illustration was not confined to the West, and China's earliest illustrations were in a printed form. Print was introduced to promote Buddhist culture with teachings in the books being "disguised" in graphic text.

China's earliest historical records show the published works of Tang Su-tsung, "Dharani mantras map." The nine year "Journal of the Tang Yizong Xiantong" (AD 868) and "Diamond Prajna Sutra" contained illustrations on their title pages. In the Song dynasty, one book illustrator made a substantial contribution to the art. Jin Yuan extended the use of illustrations to medical books, history books, geography books, and archaeological catalogues. Encyclopedias and other household texts also began to use overprint color illustrations. During the Ming and Qing dynasties, there was further development in the ancient art of illustration. As the publication industry developed all over the world, different regions developed different styles.

Illustration developed into its current form roughly as follows: front page illustrations, text illustrations, illustration above or below the table of contents, and illustrations on the inside cover. The evolution of illustration in ancient Chinese history can be seen in the history of printmaking and the history of folk paintings. Early folk artists sold their paintings as commodities, and were the predecessors of modern day commercial illustrators.

The development of printed illustrations in Europe and China is similar in that the earliest illustrations were used in religious books. Later, the illustrator's art was found in natural science books, grammar books, and other publications, among them anthologies of classical writing.

Today, illustrations are widely used in all areas of society. Illustration is an art-form that expands our horizons, enriches our minds, and offers an escape for our imagination. Many new drawing materials and instruments have entered the arena of artistic illustration. In the digital age, computers are commonly used to create high quality illustrations.

Illustrations can be classified by media, or by function. The media category is basically divided into

two parts; print media and movie media. Print media includes posters, advertising illustrations, newspaper illustrations, magazines, books, product packaging, and corporate identity promotional materials. Movie media includes films, television shows, computer displays, etc. In other words, illustrations are common in a wide range of fields. In addition, the recent rise in the digital animation can also be seen as a new illustration technique.

There are also a variety of different illustration styles, and the functional classification can be divided into lyrical, descriptive, etc. Lyrical illustrations usually contain no plot, but use beautiful colors and the romance to engage the imagination. Generally this style is whimsical, not realistic. Most illustrations are generally descriptive such as science library services. They show the structure of a plant or animal or illustrate an experimental process. Descriptive illustrations are often combined with literature, so that illustrations are collected together into scenes.

The short animation "Watch Out Behind You!" uses descriptive illustrations connected together to form a narrative. Digital techniques are used to combine hand-drawn illustration with 2D animation. By continuously presenting a series of images, the illusion of smooth movement is created.

3. The Production Process

The production process followed ten main steps: developing the plot, character design, storyboarding, hand-painting the black and white draft map, hand-painting the color draft map, analog action using 3D modeling, dynamic character integration, creating continuous motion, using Adobe Premiere software to link up the work, adding special effects using Adobe After Effects software. The following sub-sections deal with each step in detail.

3.1 Developing the plot

A short synopsis of the film is as follows: The opening scene is set in London in the 18th century. William, a vampire, is being chased by police through an underground sewer system. After picking up a small coin, he is surrounded by a burst of intense white light and is suddenly transported through time and space to the year 2016.

There is a short interval and the story continues a few days later. In 2016, the city of London has very little major crime, but a mysterious murder has caused panic in the city. There are few clues as to the killer's identity, except an image from a traffic camera that captured the face of the suspect. The photo is being shown to Detective Bruce Miller who is leading the investigation.

Jessica Banner is a scientist. It was due to her experiments with time travel that William was accidentally sent to 2016. After William began committing crimes in the future, spreading panic around London, Jessica decides to send him back to the 18th century. William doesn't want to go back; he wants to stay in London in 2016 to continue committing terrible crimes.

3.2 Character design

All characters must adhere to the same overall design. This animated story uses a vampire as the central character. There are three main roles, William Manson (vampire), Bruce Miller (detective) and Jessica Banner (scientist). Each character was modeled performing various actions. Examples are shown in Figure 1.

William Manson (Vampire)

Bruce Miller (Detective)

Jessica Banner (Scientist)
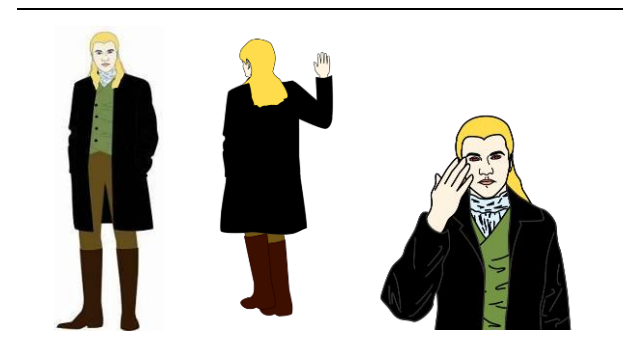
Figure 1. Character modeling

3.3 Storyboarding

Storyboarding is the process of organizing images and illustrations vertically in sequence in order to pre-visualize a movie. The script is added beside the illustrations to show the content of each scene. The time element is written in the far right. Through the storyboard, we can understand how the story unfolds, the

viewing angle, events associated with each scene, and we can begin to create the rhythm and mood of the story. Important elements of the storyboard are the lens, the scene order and the three-column layout. The lens may be panoramic to explain a situation, or explain the relationship between the story, action, and location, or the lens may be close-up to focus on a particular role or show the expression of emotions.

The thee-column layout allows an illustration to be put alongside the script, other notes, and the time element. Some examples are shown in Figure 2.
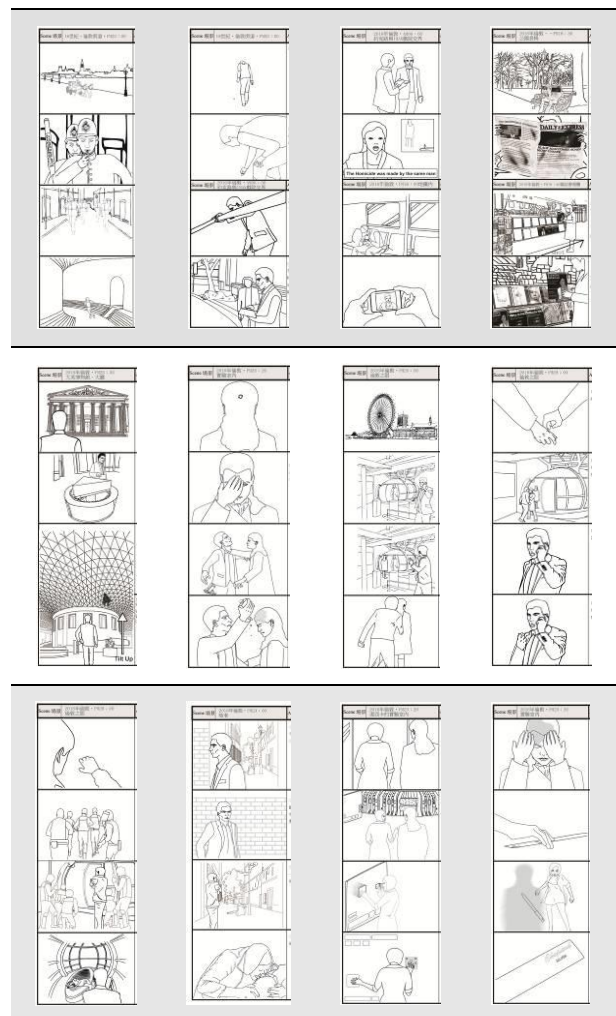
Figure 2. The storyboard

3.4 Hand-painting the black and white draft map

After completing the storyboard, the next step is to create the black and white line draft. The so-called "line draft" is the precise outline of all the scenes in the movie.

Typically the script is placed on the bottom of the draft as a reference. Scenes are copied by gently using a black pencil and repositioning some of the lines in red. Creating the black and white draft map is time-consuming, but it is an important part of animation work.

This animated story takes place in London the 18th century and in 2016. For the animation to be effective, we must organize the images for each scene. The black and white line draft is essentially a blueprint of the story. An example is shown in Figure 3.
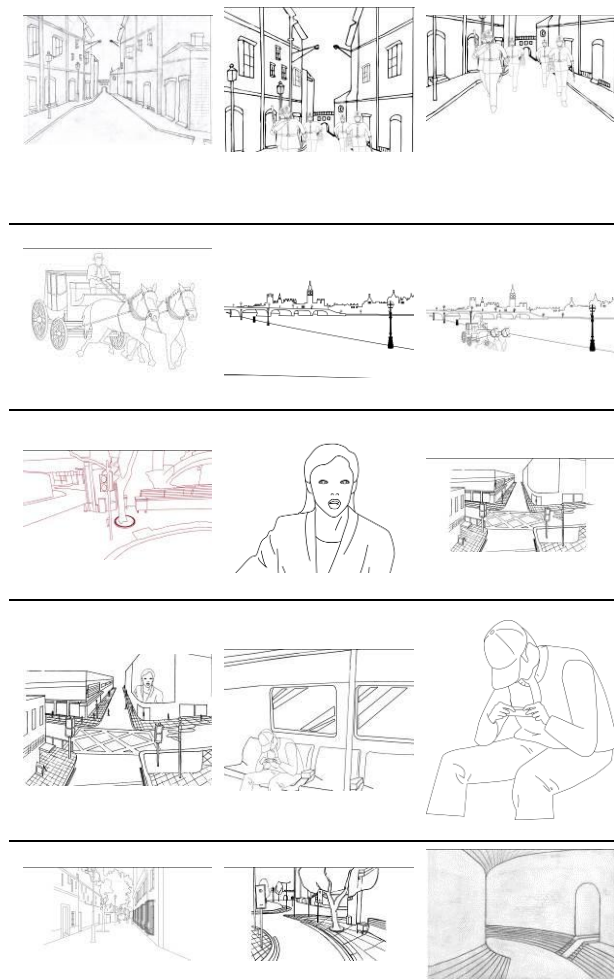
Figure 3. Black and white line draft

3.5 Hand-painting the color draft map

Once the black and white draft map is completed, the artwork is digitized using a digital scanner. Adobe Photoshop was used to colorize the images. The color pallete must be decided upon and colors must be consistently used in the artwork. Examples of the rendering process are shown in Figure 4.

Draft drawn subway train illustration	Draft line scan colorized using Photoshop	18th century sewer
Carriage	18th century police	Bruce crossing the line
Bruce in his car	Bruce with other police	Laboratory scene
2016 London Park	Jessica's sports car	News stand magazine
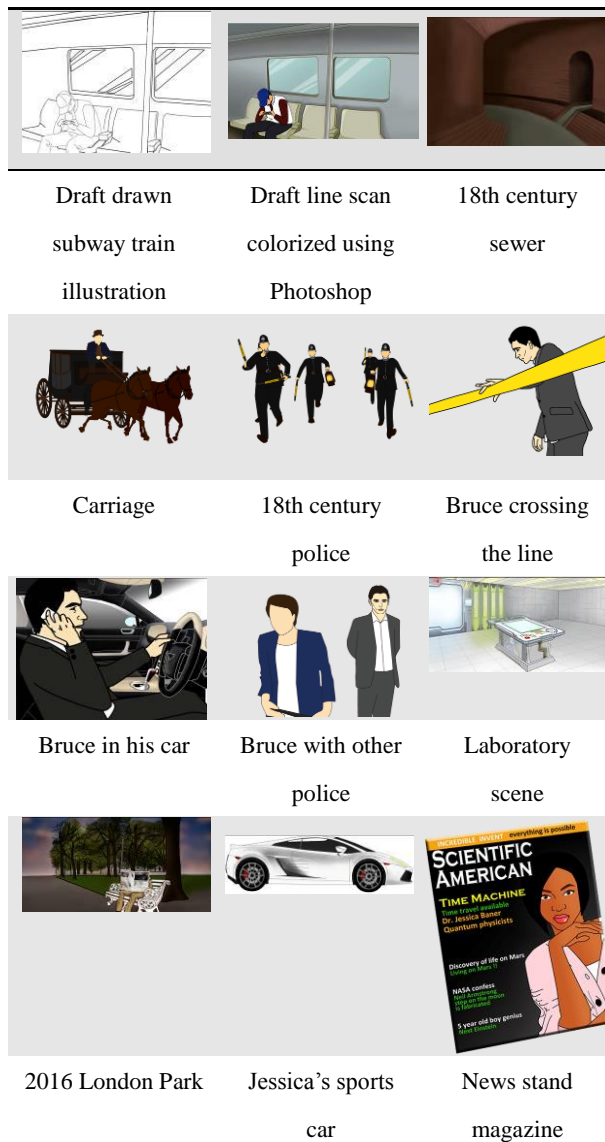
Figure 4. Completed color draft

3.6 Analog action using 3D modeling

Although this is a 2D animation animated film, to make the characters more realistic, 3Dmax software was used to create and render 3D skeletons of the characters. This step made the characters more tangible and the figures became more lifelike as a result. Some examples of 3D models are shown in Figure 5.

| Laboratory scene | Jessica pressed | Jessica under pressure |

| Open | Face pressure | William's demise |
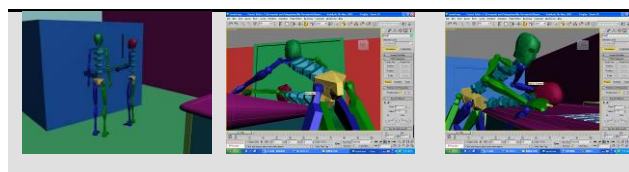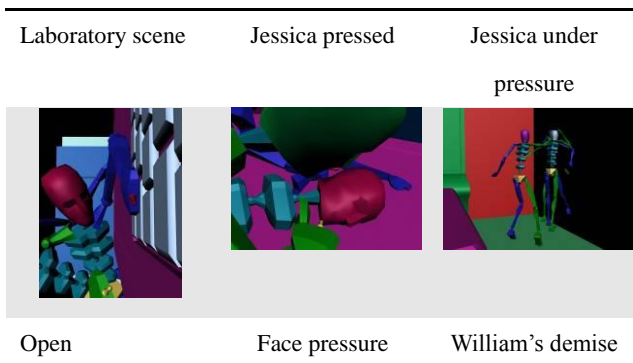
Figure 5. Three dimensional character modeling

3.7 Dynamic character integration

Draft animation is a very important part of creating the action figures. The collation of figure animations into a dynamic image composition is necessary to prepare for the next stage of continuous action. Figure 6 shows the characters in dynamic motion sequences from different scenes.

| Bruce in alley | Bruce running out the alley | Jessica ran to the door |

| Bruce hit perfume | London Eye: body | London Eye: police point |

Figure 6. Dynamic character map integration

3.8 Creating continuous motion

To produce the illusion of continuous motion, between frames must be added. This produces continuity, as long as the interval between the painted illustrations is kept constant. We found 15 frames per second more than adequate to create the illusion of continuous movement. The animators created the key frames for each action sequence and generated the frames between to give the

illusion of continuous and realistic action. Examples are shown in Figure 7.
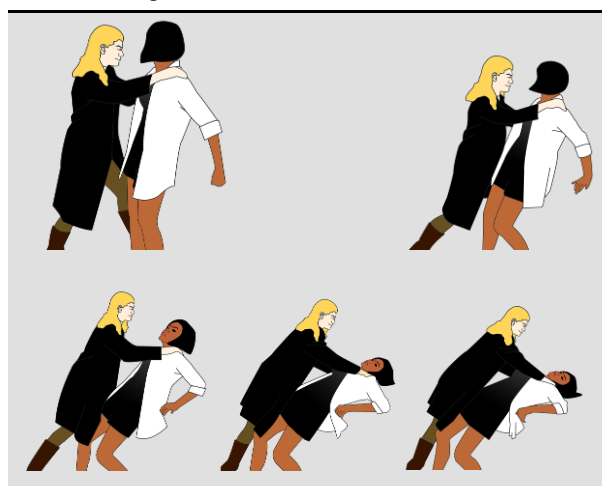
Jessica was overwhelmed by the vampire William

William ran away after the killing

Figure 7. Continuous action images

3.9 Using Adobe Premiere software to link up the work

After the animated drawing sequences have been completed, the next step is to carry out the editing work. Adobe Premiere was used to link up the hand-painted sequences. Editing consisted of going through the movie and adjusting the lens making it longer or shorter or even cropping frames in order to make the motion more fluid and realistic. After the editing work, the sound track was added to create the movie.
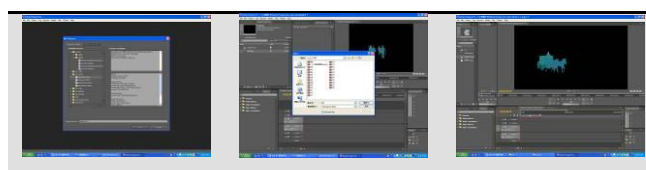
| Create a Premiere | Import continuous | Import image files |

project file	sequences	to the library
Dubbing the soundtrack	Recording video	Video output
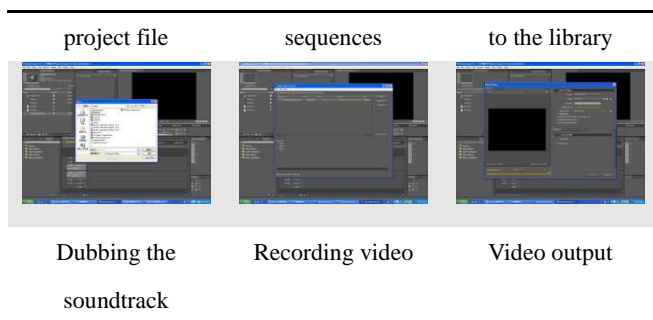
Figure 8. Using Adobe Premiere to link up the sequences

3.10 Adding special effects using Adobe After Effects software

After the movie has been exported, it can be edited using Adobe After Effects software. This post-production software is used to add special effects. A considerable number of special effects were added, including smoke, blur, running shadow, background shuttle effects, mask effects, and more. These special effects add real presence to the animation and result in a more realistic animated story.

Smoke effects	Blur effects	Running shadow effects
Bleeding effects	Car smoke effects	Subtle background effects
Mask effects	Fractal noise effect	Text effects
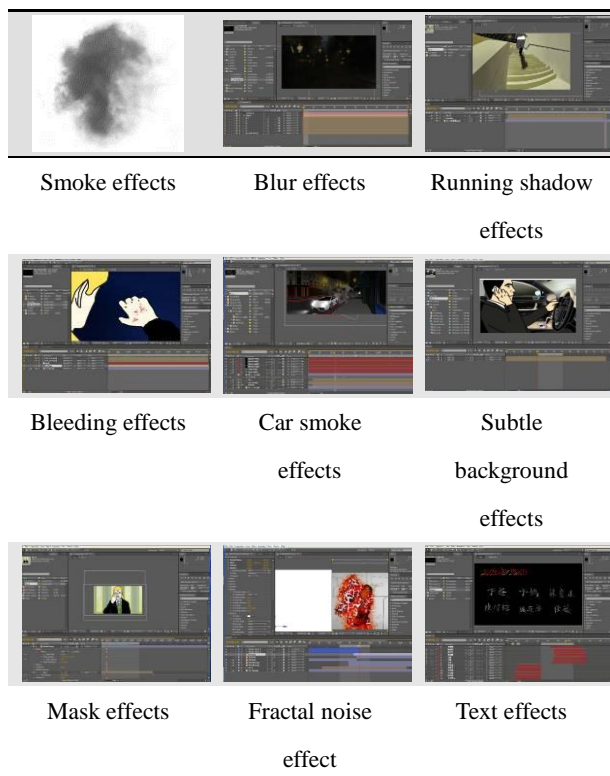
Figure 9. Using After Effects software for post-production effects

4. Results

This retro style, 2D animation demonstrates how hand-drawn illustration techniques can be used to create a powerful and complex, short animation. Over 3200 illustrations were hand-drawn and animated using computer tools. Special effects were added to provide realism. Through careful attention to character development, and painstaking attention to scene design and image color (intensity, contrast, color depth), we were able to create an appropriate framework for the story. By adjusting the speed of the animation to make it consistent with the continuity of action, and adding further special effects, we were able to exploit the dynamic aspects of each scene. English dubbing and other related operations were added later to create a storyline consistent with the dramatic narrative. The four distinctive features of this project are as follows:

4.1 Hand-painted illustrations

The method of hand-painting 3200 illustrations, though time consuming, resulted in more lifelike characters and a "granular" effect. In addition, the use of illustrations increased the visual experience by providing a stronger impact for the storyline.

4.2 Realistic 3D modelling

While the 2D illustrations are realistic in static images, we found that 3D modeling improved the realism in the animated sequences. This made the characters more life-like and their actions more fluid.

4.3 Editing arrangement

We created the animated story "piece by piece" through editing, screening, re-editing, and finalizing the product. Though the film lasts only 3 minutes and 40 seconds, more than 3200 individual illustrations had to be hand drawn and arranged into scenes to present the story. Transitions between scenes had to be planned matched to the story context. This involved a great deal of rigorous editing in order to add a true sense of drama and tension to the plot.

4.4 Use of special effects

Many special effects were added in the post-production phase of the film development. Some scenes required smoke, and in dimly lit scenes, characters required shadows. We also added effects to make the bleeding hand look more realistic. Other effects were added subtly to the background of scenes to give a stronger sense of realism.

5. Conclusions

Animation is now an important component in the visual arts scene. Computers have revolutionized the industry and tools to create 3D animation are now widespread. Yet there remains some usefulness in traditional 2D production methods. Hand-drawn illustrations can result in realistic animated productions which have an old-fashioned integrity.

The series of steps involved in developing a complete 2D animated production, from designing the storyboard, through character design, line and color drafts, colorizing, adding special effects, and post-production, have largely died away and have been replaced by faster and more modern methods. It takes a great deal of time and effort to complete a "hand-made" animation and many animators lack the will and ability to do so. In the future, we can expect further developments to automate the production process even more, thus removing the need to maintain the old skills.

Animation empowers the imagination and opens the mind to an almost limitless fantasy world. The techniques offered in this paper add realism and energy to 2D animation and we hope they will also inspire the creative talents and imagination of future animators.

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Moderating Effects of Commercial Films on Consumers' Cognition and Attitude

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Advertisement is full of our daily life in present society. Besides, with the progress of digital media technology, the advertisement production and creation become diverse, and the creative advertising contents present larger space. In consideration of the visual presentation of advertisement, a director presents the advertising text with the creativity of goods and advertisement through visualization. The visual scenes are composed of single shots, and a series of shots are organized as a meaningful story to express the advertising contents and the meaningful interpretation. Finally, the advertisement is expected to affect consumers' cognition and emotion. This study aims to discuss the moderating effects of commercial films on consumers' cognition and attitude. With Two-Way Mix Method to test and analyze the topic, it tends to understand the effects of gender on advertisement. The outcomes show that (1) Gender presents significant differences on the cognition of advertising effects, (2) male consumers appear better loyalty on brands, and (3) female consumers reveal high acceptance on sensational advertisement.

Keyword: Commercial Films (CF), Advertising Effect, Cognition, Attitude

Relevance to Design Practice: Advertising design focused on consumers' cognition and attitude, research data as a basis for the concept, can be used as subsequent advertising and related personnel, advertising production reference.

1. Introduction

1.1 Research background

With the rapid development of technology, diverse electronic media are applied to present information communication that people receive more diverse visual information. It shows that advertisement with visual communication presents close importance on interpersonal communication and information delivery. Su et al (2007) said that:

Deliver information through the composition of visual symbols which were understood and comprehended the meaning through people's visual experiences, images, and perception and further transformed into ideological reactions; such symbol languages were created and composed infinite possibilities to achieve the optimal, the most complete, and the most appropriate communication requirements, which was regarded as the ideal objective of visual design.(p.96)

Films are the media to deliver information as well as a visual and audio language. In order to create understandable visual presentation, a photographer should be able to control the visual rules and arrange the frames sot that the composition of films not only could directly stimulate viewers' visual perception, but could also affect the psychological perception after viewing.

1.2 Research motivation

Due to the subjects and the characteristics of advertisement media, it tends to reach the audience's memory with the shortest period of advertisement and to correctly deliver the image of the advertisement, as "advertisement is a purposive delivery attempting to trigger consumers' reactions to the advertisement" (Hsiao, 2009). For this reason, this study aims to discuss audience's curiosity resulted from the imaginary space before and after viewing the advertisement. In addition to contribute to the production of advertisement projects and commercial films, this study also provides assistance in deleting redundant words and reduce language gap through the film language. Based on such an idea, people

with different thoughts because of various culture and education background present distinct cognition and comprehension on advertising contents and the differences in psychological perception are regarded as the motivation for further discussions.

1.3 Research purpose

(1) To understand the effects of gener on Advertisement Perception, Brand Attitude, and Purchase Intention.

(2) To realize the effects of participants' cognitive attitudes toward advertisement on Purchase Intention.

(3) To discuss the differences of participants with different genders before and after advertising effects.

2. Literature review

2.1 Advertising effects

Ho, Liu & Lee(2006) points out, "Advertisement is mainly functioned to deliver the products or information to consumers through media and to achieve the advertising effects by completing the communication of advertisement" (p.65). Kolter indicated the methods to test advertising effects in 1995 by testing the sales effect of advertisement and the communication effect of the advertising products. Lavidge and Steiner mentioned in 1961 to have sales volumn as the measuring index of sales effects, tending to measure the effects on sales

amount after the advertisement. It was worthy noting that advertising effects might not be immediately reflected on sales(Yu, 2007) (p.6).

Yu (1998) proposed two approaches for the communication effects of advertisement. 1. Behaviorist Approach, in which consumers passively learnt the advertising contents and considered the communication of advertisement as a simple learning process. 2. Cognitive Approach, inwhich the advertisement communication was regarded as a complicated and active process, assuming that people would actively participate in learning, and consumers were more rational and complex. Lo and Cheng (1993) menitioned to evaluate advertising effects based on communication effects, as a lot of factors in the sales process could not be controlled by advertisement. As a result, advertising effects were not suitable for measuring sales effects. Instead, advertisement affecting consumers' psychological and attitude changes was regarded as the measuring standard to cause Purchase Intention. Advertising effects refer to consumers presenting cognitive understanding after the stimulation of advertisement, turning such emotion into preference, and generating memories and actions. In such a transformation, hierarcy-of-effects was formed, Figure 1.
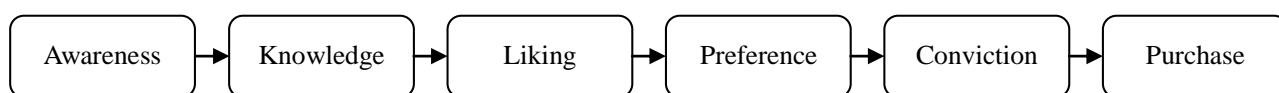
Figure 6. Hierarchy-of-effects Model (Lavidge & Gary,1961)

Regarding consumers' reaction to the advertisement levels, different terminologies were utilized by researchers. In general, three levels were classified, namely Cognitive/Learning, Affective/Attitude, and Conative/Action. Having received the information, consumers would notice, understand, memorize, accept, learn, and perceive the contents, further appear interests and preference, and finally decide the purchase intention and actions by confirming the advertisement and products (Liu, 1991). (p.7)

According to the above literature review, advertising effects are regarded as the emotional attitude caused by consumers' cognition after being continuously delivered product information through advertisement and further affecting the behaviroral intention which not simply contained a single variable, but also mutual effects among variables. In this case, this study tends to discuss advertising effects with the dimensions of Advertisement Perception, Brand Attitude, and Purchase Intention.

2.2 Visual perception

"Visual perception covers the basic elements of visual reception, as well as vision and cognition" (Tai, 2010). "The history of visual perception should be started from visual memory, i.e., certain temporary visual buffer, which could remain information in a short period of time. Such memories were also called visual sensory memory, similar to the iconic memory proposed by Neisser (1967)" (Jung, 2009). "People received external information with sensation and store it in the memory so that they could accumulate knowledge for further applications. Such information is considered primary for sensation" (Wang & Wang, 2004).

"Jean Piaget pointed out sensation and cognition as two different psychological processes that they presented distinct definitions, functions, rules, and development models, and both could not be the duplication of external affairs"(Chiang, 1970). When people receive visual messages, the sense would be stimulated to generate sensation for being stored in memory, which would further become short-term or long-term memories. With mutual reactions between the memories and sensation, cognition would be generated for relevant meanings. In this case, after visually receiving texts and pictures, cognition would be generated, and the interpretation would result in distinct meanings to affect the psychological perception. Based on the literatures, it is concluded that texts and pictures being transformed into perception through cognition would be individually distinct. Whether such a situation would be implanted to the interpreter's cognition through external methods is considered as a confirmatory issue in symbolic explanations.

2.3 Gender difference

MBA Lib (2012) indicated that males presented stronger rationality and self-confidence that the consumption characteristics contained 1.rapid and decisive formation of motivation and stronger self-confidence, 2.passive purchase motivation, and 3.less emotional purchase motivation. In this case, male consumers do not appear strong mental change in the purchase activities as females do, nor would they sink in association and imagination.

Females, on the other hand, appear stronger association with the meaning, style, and color of a brand, and are likely to present impulsive purchase behaviors. Females reveal the consumption characteristics of 1.focusing on the appearance of goods and emotional factors, 2.stressing on the practicability and detailed design of goods, and 3.emphasizing the convenience of goods and the creativity for life. In this case, innovative and convenient products would attract female consumers; and, creative affairs would appeal to their passion.

From the research of Campbell (1997) and Underhill (1999), Wu & Hsu (2011) found that Gender presented significant effects on purchase motivation, consumption attitude, and consuming products (p.4). Hsu & Lin (2007) also discovered that females focused more on goods to express self-image than males did that they were likely to appear impulsive purchase behaviors and be affected by parents or peers (p.24). In addition to Gender, age and educational background could affect consumption behaviors. For this reason, different consuming markets would present distinct strategies according to the consumption segment. Such decisions required the expression of advertisement design. This study therefore investigated the consumption characters between genders for the market segment, and further evaluated advertising effects for practical production.

3. Research method

3.1 Research questions and hypotheses

With Two-Way Analysis of Variance, the correlations between Gender and advertising effects are clarified by testing two independent variables before and after viewing the advertisement to discuss the effect on dependent variables. Having discussed the Advertisement Reaction on Gender, Two-Way Analysis

of Variance is applied to the test. The hypothesis is further proposed that both male and female participants do not appear obvious differences in advertising effects before and after viewing the advertisement. With Data Analysis to test the hypothesis, the data are further inferred and explained.

3.2 Research subjects

3.2.1 Selection of tools

Based on advertisement to reduce the research scope, advertisement for drinks appears the most. With market survey, tea drinks reveal up to 50% of the most popular non-alcohol drinks. Besides, having set the present advertisement and advertising goods as the preliminary research, data collection and market survey are focused on advertisement and goods to objectively select the best brand. King of Tea is therefore selected as the research subject for advertisement.

3.2.2 Selection of research samples

Aiming at Gender, purposive sampling and convenience sampling are utilized, and Gender is the variable of advertising effects. Total 169 research subjects contain

82 males and 87 females.

3.2.3 Test environment

Online questionnaire is applied to the test that a computer lab is selected as a quiet site for the test. Each participant would operate one computer. When the participants complete the first questionnaire, the screens are switched to the commercial film. Then, the computers are switched back to individual frame for the second questionnaire. After completing and submitting the questionnaire, the system would automatically transform the contents into data for reference.

3.3 Research procedure

Referring to literature review for the design of questionnaire and strategic marketing of advertisement, the real advertisement is sampled for the analyses of advertising brands and marketing strategies. Aiming at the tested group to analyze the literatures, the advertisement texts and sub-frames are drawn as the strategic basis of advertising contents. The implementation could be divided into three phases (Figure 2)

Stage I: testing tools
Commercial film production; then the development of advertising effectiveness before and after the two questionnaires, and build a network questionnaire.

Stage II: questionnaire measured
Subjects viewing the Commercial film, Tianda two questionnaires check questionnaire answer questions.

Stage III: data analysis
Advertising effectiveness data research and analysis, and using SPSS statistical software.

Figure 7. Three-stage Research procedure

Likert's five-point scale is utilized for the test. "Extremely disagree", "Disagree", "No comment", "Agree", and "Extremely agree" are respectively given 1-5 points to show the participants' perception. Some negative questions are prepared to avoid habitual answers.

4. Research contents

4.1 Reliability test

With online questionnaire to 20 people to predict the scale, SPSS was applied to testing the reliability, where Cronbach's α appeared 0.928, and the overall Cronbach's α ≧ 0.7. The formal advertising effect questionnaire contained seven questions for Advertisement Perception, seven for Brand Attitude, and ten for Purchase Intention.

4.2 Two-Way Statistics Analysis before and after viewing films

4.2.1 Two-Way Analysis of Variance of Gender before viewing films

From the mean analysis of descriptive statistics, Table 1 shows the differences in Advertisement Perception, Brand Attitude, Purchase Intention between males and females before and after viewing commercial films. The standard deviation statistics in phase II presented the different opinions between male and female participants.

Table 3. Descriptive statistics of Gender before viewing films

	Gender	*Mean*	*Standard deviation*	*Number*
Advertisement Perception (before)	Male	3.1951	.67661	82
	Female	3.1970	.53062	87
	Total	3.1961	.60404	169
Brand Attitude (before)	Male	3.3780	.72821	82
	Female	3.1987	.60819	87
	Total	3.2857	.67313	169
Purchase Intention (before)	Male	2.9793	.72839	82
	Female	3.0425	.58858	87
	Total	3.0118	.65890	169

From the mean of descriptive statistics, both genders revealed similar Advertisement Perception in advertising effects, while males' Brand Attitude was higher than females, showing that males preferred such brands owing to the effects of environment and background on brand loyalty. Males appeared lower Purchase Intention than females did, as males' Purchase Intention would still be affected by external factors, in spite that they generally agreed with Advertisement Perception and Brand Attitude. However, females' agreement with Advertisement Perception and Brand Attitude would directly affect their Purchase Intention.

Overall speaking, males revealed distinct opinions, as the data showed larger differences from those of females. In other words, males' distinct opinions were more obvious than those of females. The factors could be the cognitive attitude and learning process of males. Netheless, the data differences could be inferred to the background of participants which causing male participants appearing distinct opinions on selections.

With Box Test of Covariance Matrix Equation, the repetitively measured covariance of both genders in Advertisement Reaction was homogenous. With Mauchly's sphericity test and multivariate test, the factors in advertising effects were tested within groups, aiming to test whether the dimensions corresponded to the hypotheses. The data did not appear the significance, and the data followed the sphericity hypothesis that correction statistics was not necessary.

Having Tests of Within-Subjects Effects and Tests of Between-Subjects Effects to organize the Analysis of Variance, Table 2, Gender and Advertisement Reaction significantly functioned with advertising effects ($F = 5.612$, $p < 0.05$). In this case, Advertisement Reaction would affect the preference of advertising effects for both male and female participants; or, the preference for Advertisement Reaction would be affected by Gender. In addition to the significant function between the two variables, Gender (Factor A) did not appear significant differences on advertising effects ($F = 0.181$, $p > 0.05$), while Advertisement Reaction (Factor B) achieved remarkable effects ($F = 28.164$, $p < 0.01$). Under distinct Advertisement Reaction, males and females presented different preference on advertising effects, which could

explain 14.4％ variance of advertising effects. Since Gender and Advertisement Reaction significantly functioned with advertising effects, Simple Main Effect tests were further required.

Table 4. Two-Way Analysis of Variance of Gender and Advertisement Reaction

Source of variance	SS	df	MS	F	p	ω^2
Between groups	8.27	5				
Gender (Factor A)	.183	1	.183	.181	.671	.001
Advertisement Reaction[b] (Factor B)	6.743	2	3.371	28.164	**.000**	.144
Gender*Advertisement Reaction[b] (A*B)	1.344	2	.672	5.612	**.004**	.033
Within groups	208.828	501	1.131			
Within groups (participants)	168.846	167	1.011			
Residual	39.982	334	0.120			
Overall	217.098	506				

Note: [b] shows the design factor within groups, while Residual values are Error.

With Simple Main Effect tests, Gender and Advertisement Reaction mutually functioned in various Advertisement Reaction (F = 5.612, 0.004 < 0.05). Apparently, advertising effects on participants with different genders would show different Advertisement Reaction; or, participants' Advertisement Reaction would be affected by Gender. Independent factors (Factor A) and dependent factors (Factor B) were respectively compared Simple Main Effect (Table 3).

In terms of male, post-hoc comparisons in Least Square Difference (LSD) were applied. Males' preference for Brand Attitude M=3.378 was remarkably higher than it for Advertisement Perception M=3.195, with the mean difference 0.183 (significance p=0.002 < 0.05). Moreover, males' preference for Brand Attitude M=3.378 was notably higher than it for Purchase Intention M=2.979, with the mean difference 0.399 (p=0.000 < 0.05). Males' preference for Advertisement Perception M=3.195 was significantly higher than it for Purchase Intention M=2.979, with the mean difference 2.16 (p=0.001 < 0.05).

On the other hand, females' preference for Brand Attitude M=3.199 was remarkably higher than it for Purchase Intention M=3.043, with the mean difference 0.156 (p=0.001 < 0.05). Females' preference for Advertisement Perception M=3.197 was significantly higher than it for Purchase Intention M=3.043, with the mean difference 0.155 (p=0.003 < 0.05).

According to the table, Brand Attitude appeared differences in dependent factors, F=1.201 and p=0.027 < 0.05 showing the significant variance differences of Brand Attitude. With comparisons, male (3.38) ＞ female (3.20) that participants with different genders appeared obvious differences on Brand Attitude. The significance of Advertisement Perception and Purchase Intention were larger than 0.05, revealing that there was no obvious difference in Gender.

Table 5. Two-Way Test of Simple Main Effect of Gender and Advertisement Reaction

Source of variance	SS	df	MS	F	Sig	Post-hoc
Advertisement Reaction (dependent)						
In male group (a1)	6.535	2	3.267	27.225	**.000**	b1＞b3；b2＞b1；b2＞b3；
In female group a2)	1.400	2	.700	5.833	**.000**	b1＞b3；b2＞b3
Error (Residual)	39.982	334	0.120			
Gender (independent)						
In Advertisement Perception (b1)	.000	1	.000	.000	1.00	
In Brand Attitude (b2)	1.358	1	1.358	1.201	**0.27**	a1＞a2
In Purchase Intention (b3)	.169	1	.169	.149	0.70	
Error (Residual)	208.828	501	1.131			

4.2.2 Two-Way analysis of variance of gender after viewing films

Table 6 .Descriptive Statistics of Gender after viewing films

	Gender	Mean	Standard deviation	Number
Advertisement Perception (after)	Male	3.1202	.77191	82
	Female	3.2890	.53717	87
	Total	3.2071	.66495	169
Brand Attitude (after)	Male	3.3380	.77778	82
	Female	3.2299	.61786	87
	Total	3.2823	.70002	169
Purchase Intention (after)	Male	3.1134	.80073	82
	Female	3.1437	.57440	87
	Total	3.1290	.69156	169

From the descriptive statistics mean in Table 4, males appeared lower Advertisement Perception than females did after the stimulations, that females were better in comprehending and interpreting advertising information than males were. Males presented higher Brand Attitude than females did that males preferred the brand than females did. Purchase Intention of males was lower than it of females, showing that females appeared better Purchase Intention after the stimulation of advertisement.

The overall Advertisement Perception, Brand Attitude, and Purchase Intention were agreed.

In general, males appeared distinct opinions after receiving stimulations. In other words, the data differences in males were larger. Besides, the differences in Purchase Intention were also larger that male participants revealed more obvious differences on Advertisement Perception and Brand Attitude than females did. Purchase Intention therefore was distinct as well. Females showed more different opinions on Brand Attitude; however, Brand Attitude appeared fewer effects on females' Purchase Intention. It was inferred that females did not concern about the preference for brands when purchasing products.

With Box Test in Covariate Matrix Equation, the repetitively measured covariance matrix in Advertisement Reaction of both genders did not show homogeneity, showing the heterogeneity and unequal parent covariance matrix. According to the data, the tested samples were merely suitable for one-way variance. With Mauchly's sphericity test and multivariate test, the factors in advertising effects were tested within groups. The data achieved the standard, but the data did not correspond to the sphericity hypothesis that the

correction statistics were utilized for testing the values of Greenhouse-Geisser and Huynh-Feldt. Greenhouse-Geisser showed the test value ε=0.877, and Huynh-Feldt revealed ε=0.891. Both values did not exceed the standard 0.75. Based on the data, they still followed the sphericity hypothesis. Relatively, with the stimulation of Advertisement, the measured values were paired for deduction, and the different variance was equal.

With Tests of Within-Subjects Effects and Tests of Between-Subjects Effects, Gender and Advertisement Reaction significantly functioned with advertising effects (F＝6.102, p＜0.05), Table 5. In this case, both male and female participants' advertising effects would be affected by Advertisement Reaction; or, participants'

Advertisement Reaction would be affected by Gender. The function effect of the two independent variables appeared 0.035, showing the mutual function of Gender and Advertisement Reaction could explain 3.5 ％ variance of advertising effects. In addition to the mutual functions between the two variables, Gender did not appear notable differences on advertising effects (F＝0.750, p＞0.05), while the main effect of Advertisement Reaction reached significance (F＝7.688, p＜0.05). Under distinct Advertisement Reaction, both genders revealed remarkably different advertising effects, which could explain 4.4％ variance of advertising effects. Since Gender and Advertisement Reaction presented notably mutual functions, Simple Main Effect tests were further required.

Table 7. Two-Way Analysis of Variance of Gender and Advertisement Reaction

Source of variance	*SS*	*df*	*MS*	*F*	*p*	*ω²*
Between groups	3.773	4.508				
Gender(Factor A)	.116	1	.116	.102	.750	.001
Advertisement Reaction[b](Factor B)	2.039	1.754	1.162	7.688	**.001**	.044
Gender*Advertisement Reaction[b] (A*B)	1.618	1.754	.922	6.102	**.004**	.035
Within groups	235.221	459.962	1.294			
Within groups (participants)	190.934	167	1.143			
Residual	44.287	292.962	.151			
Total	238.994	464.47				

Note: [b] shows the design factors within groups, while Residual value was Error.

With Simple Main Effect tests, Gender and Advertisement Reaction appeared significantly mutual functions (F＝6.102, p=0.004＜0.05) that participants with different genders would be affected Advertisement Reaction by advertising effects; or, participants' Advertisement Reaction would be affected by Gender. Independent and dependent factors therefore were separately compared Simple Main Effect (Table 6).

With post-hoc comparisons in Least Square Difference (LSD), males' remarkably presented higher Brand Attitude M=3.338 than Advertisement Perception

M=3.120, with the mean difference 0.218 (p=0.03＜0.05). Males showed notably higher Brand Attitude M=3.338 than Purchase Intention M=3.113, with the mean difference 0.225 (p=0.000＜0.05).

On the other hand, females revealed significantly higher Advertisement Perception M=3.289 than Purchase Intention M=3.144, with the mean difference 0.145 (p=0.007＜0.05). Females presented remarkably higher Brand Attitude M=3.230 than Purchase Intention M=3.144, with the mean difference 0.086 (p=0.037＜0.05).

The significance of Advertisement Perception, Brand Attitude, and Purchase Intention＞0.05 showed that the variance did not achieve the significance, and Gender did not reveal obvious differences.

Table 8. Two-Way Test of Simple Main Effects of Gender and Advertisement Reaction

Source of variance	SS	df	MS	F	Sig	Post-hoc
Advertisement Reaction (dependent)						
In male group (a1)	2.676	1.682	1.591	10.536	**.000**	b2＞b1；b2＞b3
In female group (a2)	.929	1.828	.508	3.364	**.040**	b1＞b3；b2＞b3
Error (Residual)	44.287	292.962	.151			
Gender (Independent)						
Advertisement Perception (b1)	1.203	1	1.203	0.930	.099	
Brand Attitude (b2)	.493	1	.493	0.381	.317	
Purchase Intention (b3)	.039	1	.039	0.030	.777	
Error (Residual)	235.221	459.962	1.294			

4.2.3 Advertisement Reaction T test before and after viewing films

To discuss the difference in Advertisement Reaction before and after viewing commercial films, it was based on the data of pair-sampled T tests and no null hypothesis appeared in the sample statistics. Advertisement Perception, Brand Attitude, and Purchase Intention of different genders did not show significant differences.

Male participants' Advertisement Perception appeared the significance $0.321 > 0.05$ and Brand Attitude showed the significance $0.522＞0.05$ before and after viewing films, presenting not achieving the significant standard that null hypotheses were necessary, and male participants' Advertisement Perception and Brand Attitude before and after viewing films did not show remarkable differences. The significance of Purchase Intention appeared $0.036＜0.05$, reaching the significant standard that null hypothesis was not necessary, and males' Purchase Intention revealed notable differences before and after viewing films. Female participants' Advertisement Perception before and after viewing films showed the significance $0.045＜0.05$, reaching the significant standard that null hypothesis should be deleted, and females' Advertisement Perception appeared remarkable differences before and after viewing films. The significance of Brand Attitude was $0.586 > 0.05$ and Purchase Intention was $0.087 > 0.05$, presenting not achieving the significant standard. Null hypotheses were therefore necessary, and females' Brand Attitude and Purchase Intention before and after viewing films did not appear remarkable differences.

Male participants' Purchase Intention presented the mean (2.979) before viewing films less than it (3.113) after viewing films. Purchase Intention was remarkably enhanced that males might concern more about practical functions or values so that there were differences in Purchase Intention. Female participants' Advertisement Perception showed the mean (3.197) before viewing films less than it (3.289) after viewing films. Advertisement Perception was relatively enhanced that females were likely to be involved in the information offered by the advertisement and appear resonance with the advertising contents.

5. Conclusions

Commercial films are utilized as the stimulator for discussing the advertising effects of Advertisement Perception, Brand Attitude, and Purchase Intention when individuals presenting cognitive comprehension through advertisement, transforming it into emotional preference, and further generating memory, identity, and follow-up actions. The specific conclusions are listed as follow.

5.1 Male consumers present higher loyalty to brand

Lin (2005) argued that consumption behaviors could also be affected by Gender. From the past relevant research, Gender could result in distinct consumption behaviors and intentions (Kuo, 1994). Huang (2002) mentioned that males tended to emphasize the practical function of products, whie females focused more on the appearance and popularity. In domestic research, males were found more economical than females. Besides, males appeared higher preference on Brand Attitude and concerned more about the brand of products. Relatively, when a brand could offer male consumers with more information and identity, the brand image would be promoted that they were likely to become the loyal consumers. In this cae, when preceding certain promotion on such groups, it would be easier to succeed. Besides, brand image could be emphasized in the advertisement so that the consumers could become the target groups.

5.2 Female consumers appear higher acceptance on sensational advertisement

Female consumers were likely to present strong emotion in the purchase process that the purchase objective was relatively blurred. Besides, environmental factors appeared large effects on Purchase Behaviors that females were likely to present impulsive consumption behaviors because of promotions. This study discovered that females would enhance Advertisement Reaction after viewing commercial films that females concerned more about sensational advertisement. Lee (2007) mentioned that females' consumption behaviors presented strong emotion; when purchasing products, they concern more about the emotional meaning in the product. Lin (2010) referred to Meyers-Levy and Maheswaran (1991) and Putrevu (2001) and concluded that females appeared more comprehensive and careful information management than males did, as females would accept and comprehend all the information as much as possible, while males simply inferred from a single clue (Kempf, et al., 2006). These literatures or research outcomes presented that sensational advertisement were likely to be resonant with females. Besides, females showed more impulsive purchase characteristics than males did. When receiving the stimulation or effects of advertisement, females were likely to appear emotional identity and consumption behaviors than males. As a results, when a manufacturer utilizing the advertising strategy of sensational advertisement, such characteristics could be taken into account as the strategic and creative ideas.

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The Role of Music on Website from the View of Gender Difference

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Background music is a common and dominant ambient variable in numerous commercial environments, such as retail stores or restaurants. The notion of music congruence has been found as an influential stimulation element in the context of advertising and retailing. This study explores the interaction of music congruence and online user and propose some theoretical and managerial implications for online-related industry.

1. Introduction

Background music plays a common and dominant variable in numerous commercial environments, such as retail stores or restaurants. Lately, many e-marketers also have added music to their websites. A study by Jupiter Research showed that 23% of the Web's top 75 sites use ambience music to attract online users (Crockett 2001). By adding music to their websites, e-marketers expect that music could be a wonderful enhancement to increase online consumer experiences. For example, Jeff Bezos, founder and CEO of Amazon.com, notes that creating a compelling online experience for online customers is the key to competitive advantage on the Internet (Weber 1999). To enhance consumer online experience, many suggest creating consumers' flow experience is a crucial factor (e.g. Hoffman and Novak 1996).

Flow is able to provide powerful bond between a website and individuals. The increased flow experiences directly translate into increased site activity and revenue (Grey Tedesco 2000). Csikszentmihalyi (1990) proposes that music is one of sources to create an individual's flow experience. However, little research has been examined the relationship between music and flow on the Internet.

The influence of music on consumers' response has inconsistent pattern. Many claimed that music might enhance (e.g. Hecker 1984), but some found it inhibit (e.g. Sewall and Sarel 1986) consumers' message reception. Grayston (1974) argued that music must fit the situation in which it is used, and the wrong music can produce unintended effects. Environment is one of the factors determining whether music generates positive or negative effects (Alpert 1991). This study focuses on the congruence (or fit) between music and the virtual environment in which music is used. Compared to other time-, texture-, and pitch-related properties of music, congruence property does not require adjusting musical structure and is more feasible to be controlled (Kellaris and Kent 1994; Bruner 1990). The notion of music congruence has been found as an influential stimulation element in the context of advertising and retailing (e.g. MacInnis and Park 1991; Areni and Kim 1993). In line with this research stream, we expect that music congruence might have similar effects on online consumers.

In addition, previous research suggests that females and males respond to music stimulation differently (e.g. Corso 1963). Gender moderates the effects of music on consumer evaluations is evident in several marketing studies (e.g. MacInnis and Park 1991; Kellaris Cox and Cox 1993). An important marketing implication of the gender effects on music concerns how to satisfy different sex of online users' needs effectively. Unlike traditional shopping, females no longer dominate in online shopping. Until 1997, males made up 65% of all Internet users and they were the major segment for online shopping. With

increasing growth of female online users, the sizes of male and female segments are very close, which account for 48% and 52% respectively in 2004 (eMarketer, April 2005). The cost of losing either segment might be expensive for any online store. Therefore, it is necessary to examine any gender difference on the effect of music congruence in an e-tailing setting.

2. Literature Review

2.1 Music congruence

The terms of music's fit and music congruence are very alike. the notion of music's fit is first introduced the by MacInnis and Park (1991) and specifically defined "fit" as consumers' subjective perceptions of the music's relevance or appropriateness of the lyrics of a song to the central ad message. Kellaris, Cox and Cox (1993) propose music-message congruence that embraces nonverbal-verbal (including songs with lyrics and instrumental music) congruence between music and the main theme of the ad. To compare with music's fit, the music-message congruence is adopted in this study, because it contains broader scope.

Music is able to convey meanings (Holbrook and Bertges 1981) or imagery (Stewart, Farmer and Stannard 1990) that could be either congruent or incongruent with the context or environment in which it is used. Pomerantz (1981) notes that when elements of a stimulus set complement (or congruent with) other items in the set, the individual parts are not perceived as separable, do not compete with one another for cognitive resources, and hence create "emergent meaning." In other words, congruent music may help delivering the key theme of its environment, and then, it may facilitate individuals' information processing toward the environment. On the other hand, if the music doesn't fit to the environment, it may distract one's attention or even inhabit one's information processing because cognitive resources are utilized to resolve incongruity (MacInnis and Park 1991).

Several studies have examined the effects of music

congruence on consumer behavior in advertising and retailing contexts. All the studies suggest that music must fit to the context in which it is used in order to produce positive effects, otherwise incongruent music may cause distractions and inhibit consumers' information processing. (MacInnis and Park ：1991；Areni and Kim's：1993)

Therefore, the mechanism of music congruence on consumer behaviors may also hold in the context of e-tailing will be expected. Which means music congruence to consumers' subjective perceptions of the music's relevance or appropriateness to the central theme of an online store? When music is congruent with the theme of an online store, it will generate positive effects on consumers. Alternatively, music that does not fit with the key theme is a distractor and, therefore, will result in negative effects.

2.2 Gender differences-hearing sensitivity and optimum stimulation levels

In spite of music has impacts on consumers, the effects of music may vary with the sex of listeners. In audiology research, Kellaris and Rice (1993) found that females reacted adversely to louder music than their counterparts. These studies suggest that females are more aware of music played in the background and that women are likely to be more sensitive whether the music sounds appropriate for that particular shopping environment.

Besides, another theory suggesting gender difference on auditory stimulation is derived from optimum stimulation level theory. Hebb (1955) contended that every organism most prefers a certain level of stimulation, which referred as optimum stimulation level (OSL). When the environmental stimulation is below optimum, an individual will attempt to increase stimulation. On the other hand, when it is above optimum, she or he will strive to reduce it. A large discrepancy between a current environment and a person's ideal OSL will lead to adjustments and,

therefore, may result in one's lower evaluations toward the current environment.

In addition, McReynolds (1971) noted individual differences in the amount of stimulation considered optimal by a given person. Individuals with higher OSLs tend to seek more environmental stimulation than individuals with lower OSLs. Prior research has found evidence for gender differences on optimum stimulation levels. Studies from Japan, Thai, English and U.S. (Zuckerman1979) indicate a consistent result that males have higher OSLs than females. Zuckerman (1988) offers a biological explanation that OSL is significantly negatively correlated with the level of the enzyme monoamine oxidase (MAO) and that females have higher levels of MAO than males at nearly all ages. Conclusively, due to their higher OSLs, males are likely to need more environmental stimulation than females to achieve their satisfactory stimulation levels in a less stimulating environment.

2.3 Flow experience

Csiksezenthmihalyi (1977) first introduced the concept of flow, describing "the state in which people are so intensely involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it" (Csikszentmihalyi 1990, p. 4). Flow state is an intrinsic motivation and reflects an inner state of experience. Hoffman and Novak (1996) argue that a computer-mediated environment (CME) may produce a flow experience in Internet users. They define flow as "the state occurring during network navigation, which is (1) characterized by a seamless sequence of responses facilitated by machine interactivity, (2) intrinsically enjoyable, (3) accompanied by a loss of self-consciousness, and (4) self-reinforcing" (Hoffman and Novak 1996, page 57). Flow characterizes the subjective human-computer interactions experience (Webster, Trevino and Ryan 1993; Ghani and Deshpande 1994). Internet users with a higher flow state may feel playful, totally involved, lost the track of time, and enjoy the navigation process. Flow is a compelling online experience and a critical factor of consumer online experience (Hoffman and Novak 1996).

3. Hypothesis

Due to the theories discussed above, there are three hypotheses are developed. Csikszentmihalyi (1990) proposes that music can induce flow experiences. He argues that music, which is organized auditory information; helps organize the mind that attends to it. As a result, music reduces the disorder people experience when random information interferes with goals When background music is congruent with the theme of an online store, it is organized to play a complementary role in that particular shopping environment. Therefore, congruent music may have positive effect to induce online consumers' flow experiences.

In addition, gender difference on auditory stimulation literature suggests that such positive effect of congruent music might vary with gender of listeners. Because women are more hearing sensitive (Cosco 1963), the effects of congruent music on females might be stronger.

H1: Females will have higher levels of flow experiences than males, on a website with congruent music

In contrast, if background music is not compatible with the theme of an online store, it is not regarded as organized auditory information. Such distraction may also decrease online consumers' interest because it requires more mental efforts to process information (Csikszentmihalyi 1990). Therefore, incongruent music may have a negative effect on individuals' flow experiences.

Additionally, incongruent music might sound annoying. A study by d'Astous (2000) found that women appear to be more easily irritated than men by displeasing environmental stimuli. With their more acute

hearing (Corso 1963), females could be more annoyed and distracted by incongruent music. Incongruent music may decrease more attention, interest or enjoyment in women than in men. Therefore, under such condition, women might be less likely to experience flow state than males when they are online.

Besides, OSL research suggests men have higher optimum stimulation levels (Zuckerman 1979). That is, when an environment is below optimum stimulation level, men need more stimulation than women to achieve their satisfactory levels. Although incongruent music distracts attention, it adds more information to a text-only website. Incongruent music may make such unexciting website more stimulating because it adds variety or complexity to a text-only website (Berlyne 1960). In other words, incongruent music might not induce as much negative effects in men as it would in females. Taken together, it is expected that:

H2: Females will have lower levels of flow experiences than males,on a website with incongruent music

Based on environmental psychology and OSL literature, gender difference will be expected on their flow experiences on a website without music. Environmental psychology literature suggests that both congruent and incongruent background music add information to the environment in which it is used (Berlyne 1960). An environment with more information is considered more stimulating (Mehrain and Russell 1974). Thus, a website without music might be less stimulating compared to a website with music.

According to Sttnkamp, Baumgartner and Wulp (1996)，they propose the concept of the need for stimulation (NST), which is referred to the difference between the optimum and current stimulation levels as a person's need for stimulation. If NST is zero, this person would achieve his or her optimum stimulation level and feels most comfortable with the current environment. Otherwise, a person with greater NST may not feel comfortable with the current environment. The higher a person's OSL relative to his or her current level of stimulation, the greater NST. In other words, a text-only website without music might not be stimulating enough for males to reach their satisfactory stimulation levels compared to females. Therefore, a hypothesis is developed as:

H3: Males will have lower levels of flow experiences than females, on a website without music

4. Research Methods

A laboratory experiment using a 3 (music factor) X 2 (gender) between-subjects design was employed. A fictitious company named "Caribbean Travel Net" (CTN) was developed, providing travel information for two islands in the Caribbean. Music was manipulated by using three conditions: music congruence (music that is congruent with the central theme of CTN's website in the study), music incongruence and no music. A total of 167 subjects participated in this experiment, including 93 male and 74 female students. The statistical result revealed a successful manipulation ($\overline{X}_{congruent}$ =6.13 > $\overline{X}_{incongruent}$ =3.13, $F_{(1, 107)}$= 111.27, p < .000). No gender differences on music congruence (t=-1.314, n.s.), music volume (t=1.293, n.s.), and music likeability (t=1.089, n.s.) were found. ANOVA results indicated an interaction effect between music and gender ($F_{(2, 161)}$=4.351; p<0.014), but no main effects for music ($F_{(2,161)}$=1.862; n.s.) and gender ($F_{(1,161)}$=0.684; n.s.). Three one-tailed T-tests were performed to test the hypotheses (See Table 1). H2 and H3 were supported, but not H1.

Table 1. De Music Selections

No.#	Type of Music	Title of Music	Seconds	Results
1	Pop-Rock, atmospheric	4U-OSAMA_HA-70	11	
2	Rap, atmospheric	adams-Jakub_Ko-2174	10	
3	Caribbean style (strong)	Spyrooo-Double_P-416	8	
4	Atmospheric	ambient_rogrigo-2320	13	Unfit
5	Caribbean style	Reggae_l-Osnoff-2377	11	Fit
6	Atmospheric (very melancholic)	Duduk3_kan_muft	13	
7	Caribbean style (strong)	Summer_D-An_Duc_T-4611	15	
8	Atmospheric (Great Wall of China)	Greatwal_adam_695	11	

5. Finding & Conclusion

The key finding in the current study is that the effects of music congruence on flow experience vary with sex of online users. Most of the hypotheses received fairly empirical support. Females had lower levels of flow experiences than males on a website with incongruent music, while males had lower levels of flow states under no music condition. Although the statistical result was not significant, the direction of gender difference on flow experiences ($\overline{X}_{female}$=4.84, $\overline{X}_{male}$=4.78) was consistent with our proposition, stating that females' flow experiences are higher under congruent music condition.

The research results offer two managerial implications. Firstly, it suggests that the addition of congruent music in an online store would facilitate both genders' flow experiences. Therefore, congruent music should be relevant to the topic, or the image of an online store. Secondly, men and women has different reaction toward website music, especially under incongruent and no music conditions. A website with incongruent music may drive female consumers away while a website without music may disappoint males. Therefore, online designers should be careful to use congruent music to increase Internet users' flow experiences for both genders.

To sum, music play an important and effective role on online environment. For online-related industry, to know how to utilize the congruent music is a creative way to highlight the online user's flow experience and then may help boost the market share.

Table 2. Confirmatory Factor Analysis - Flow

Flow (second order factor; a = .87)	Coefficient
Interest (a = .81)	
Browsing on this website bored me.(R)	
This website was fun for me to navigate.	0.944
Browsing on this website was interesting.	
Curiosity (a =.86)	
Interacting with this website made me curious.	
Browsing on the website aroused my imagination.	0.965
Browsing on this website excited my curiosity.	
Attention (a =.45) *When navigating on this website:*	
I was aware of distractions.(R)	0.639
I thought about other things.(R)	

I was totally absorbed in what I was doing. (deleted)	
Control (a =.77)	
I felt that I had no control over my interaction with this website. (R)	0.549
This website allowed me to control the computer interaction.	
When navigating on this website, I felt in control.	

Table 3. Summary of Hypotheses Tests

Music conditions	Male	Female	Z-value[a]	P-value (one tail)
Congruent music (H1)				
Mean	4.78	4.84	0.211	0.416
S.D.	0.184	0.206		
Incongruent music (H2)				
Mean	4.71	4.29	1.372	0.085*
S.D.	0.181	0.245		
No music (H3)				
Mean	4.08	4.85	2.81	0.002**
S.D.	0.196	0.19		

Notes: [a]: Z-value is absolute value; * Significant at 0.10 ; ** Significant at 0.05

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A Study on Application of Kano Model to Satisfaction Quality with Different Type of Website

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As the functions of the websites are expanded and more complicated, users' fear toward technological attacks has deepened the gap between humans and machines. Past studies on website design mostly focus on visual factors, use or functions. There are rich findings accumulated; however, the design quality of websites still has great discrepancy, and users still complain about the unfriendliness and lack of security of websites. The reason is that past studies only indicate the advantages and disadvantages of website design and could not provide the characteristic value related to design principles for the designers.

This study applied Kano model and conducted questionnaire survey on university students who have visited websites to evaluate the quality attributes and satisfaction with portal sites and blogs, which are two popular types of website. Research findings specifically identify characteristic value of different types of website, and demonstrate the influences of different characteristics on users' satisfaction. The findings can serve as references to academia or practical design.

Keyword: characteristic evaluation, Kano model, satisfaction with quality, website design

1. Introduction

According to the Internet Broadband Usage Survey in Taiwan (2010) by the Taiwan Network Information Center (TWNIC), the Internet population in Taiwan already exceeded 14.6 million people. Users are spending longer hours on the Internet and increasingly relying on the Internet for their daily life activities.

Many past studies on the website design have addressed these issues from the perspective of visual design or usability. Zhang & Dran(2000) indicated that most website assessment criteria fail to provide the characteristic value of the design criteria. Some scholars argue that most website designs nowadays cannot meet the needs of users (Chevalier & Ivory 2003; Chevalier 2004). Hence, In order to create favorable competitive advantages, website operators must first clarify and recognize the potential factors of website users' satisfaction.

The Kano model emphasizes on two-dimensional perspectives in the interpretation of the correlation between quality and satisfaction. This prompts designers or evaluators to understand the level of quality expectations from users. The Kano model has been widely used in the service industry and various research projects (Phillips & Phillips 2007; Tontini 2007). Therefore, By quality evaluation and satisfaction improvement measures developed by previous researches Huang & Guan(2010), this study probes into the relationship between design quality of different types of website and users' satisfaction in order to recognize satisfaction difference with different qualities as criterion for application priority of characteristic design in construction of websites.

2. Literature Review

2.1 Studies related to website design quality

By case study, O'Boyle et al. (2009) analyzed portal sites of governmental organizations by heuristic evaluation and technology acceptance model to suggest usability design for the internal website of firms. By experiment, Chevalier & Kicka (2006) compared searching behavior and cognition of new users, experienced website users, and professional website designers when they visited websites with or without user-centered design. The result

showed that designers could not predict new users' strategies; hence, it was suggested developing the channels supporting designers' user-centered design. Chen & Macredie (2005) investigated e-service in four supermarkets in the UK by heuristic evaluation upon two-stage experiment of free browsing examination and task examination. The finding showed that the most common and meaningful issues of website use could be "users' control and autonomy" and "help and use instruction". By factor analysis and technology acceptance model, Tsai (2005) elaborated users' acceptance and use of portal sites, and constructed portal site service quality scale, including five dimensions: applicability, safety, completeness of content, response and appearance design. The results demonstrated that among dimensions of website service quality, appearance design has the most influence on website satisfaction, while safety has the least.

Therefore, Huang & Guan (2010) based on Herzberg's Two-Factory Theory, this study generalized the assessed dimensions and characteristics based on literature review and discussion with five experts experienced in website design in two focus-group meetings. Following an analysis on reliability and validity and a factor analysis, this study proposed three assessed dimensions, namely visual, usage and information. The visual dimension consists of 3 factors, 16 assessed characteristics; the usage dimension consists of 9 factors and 42 assessed characteristics; the information dimension consists of 6 factors and 29 assessed characteristics. In order to takes the website design quality appraisal pattern, this study conducted another literature review and held two expert interviews in order to propose the operational definitions of "generality-attractiveness-danger", which are the three assessed dimensions for the quality of website browsing environments.

Based on the above, although past studies specifically indicated the rules of website design and

evaluation, design quality of most websites is still uneven. Therefore, for website design, it is urgent to identify design characteristics in order to serve as a reference for designers' construction and evaluation.

2.2 Kano Model

The Kano model is proposed by Noriaki Kano (1984), a Japanese scholar, in 1984. This concept is originated from the Two-Factor Theory developed by Herzberg, a psychologist. Kano examined quality from the subjective and objective perspectives. The subjective perspective refers to the satisfaction of consumers; whereas the objective perspective indicates the quality itself. Kano model includes three major quality factors (must-be quality, one-dimensional quality and attractive quality) and two secondary quality factors (indifferent quality and reverse quality). Attributes of quality are shown below:

(1) Must-be quality: When the quality prerequisites are sufficient, the levels of satisfaction do not improve. However, if the quality prerequisites are insufficient, the levels of dissatisfaction increase.

(2) One-dimensional quality: Customers would be satisfied if this quality element would provide; otherwise, they would be dissatisfied.

(3) Attractive quality: When the quality prerequisites are sufficient, the levels of satisfaction improve significantly. However, if the quality prerequisites are insufficient, the levels of dissatisfaction do not rise.

(4) Indifference quality: Regardless whether the quality prerequisites are sufficient or not, the levels of satisfaction remain the same.

(5) Reverse quality: When the quality prerequisites are sufficient, the levels of satisfaction decline proportionally. However, if the quality prerequisites are insufficient, the levels of satisfaction rise proportionally.

Berger et al. (1993) suggested that when there are questionable or unidentifiable scores in questionnaire survey on quality attributes, the quality factor should be called "Questionable quality".

2.3 Establishment of Kano Model

The classification of Kano quality attributes consists of a set of positive and negative questions. Users assess their own levels of satisfaction based on the sufficiency and insufficiency of certain quality prerequisites(see Table 1). The result of the questionnaire survey refers to the modes (based on the frequencies) of the quality attributes provided by the respondents as the representatives. Berger et al. (1993) indicated that if the questions are in-depth or in-detail, the results may be distributed. Hence, they suggested that if (O+A+M)> (I+R+Q), the maximum value of (O, A, M) should be adopted. Otherwise, the maximum value of (I, R, Q) should be used. O, A, M, I, R and Q denote the percentages of One-dimensional qualities(O), Attractive qualities(A), Must-be qualities(M), Indifference qualities(I), Reverse qualities(R) and Questionable qualities(Q), respectively. Matzler & Hinterhuber (1998) applied the Kano model and develop the satisfaction coefficients of users that consist of satisfaction coefficients and dissatisfaction coefficients. They analyzed the levels of possibly satisfaction and dissatisfaction regarding certain quality prerequisites, as shown by Eq. 1 and Eq. 2. where A, O, M and I denote Attractive qualities(A), One-dimensional qualities(O), Must-be qualities(M) and Indifference qualities(I), respectively (applied throughout the paper).

Satisfaction coefficients=(A+O)/(A+O+M+I)…....(Eq. 1)

Dissatisfaction coefficients=(M +O)/(A+O+M+I).… (Eq. 2)

Table 1. Decision Matrix for Kano Quality Attributes

Product		Insufficient Prerequisites				
needs		Satisfaction	Taken for grated	No feelings	Bearable	Diss-atisfied
Sufficient Prerequisites	Satisfaction	Q	A	A	A	O
	Taken for granted	R	I	I	I	M
	No	R	I	I	I	M
	Bearable	R	I	I	I	M
	Dissatisfied	R	R	R	R	Q

2.4 Application of Kano Model

Helmi et al. (2008) applied the Kano model to systematically discriminate the needs of capital managers. They compared many innovative concepts based on their needs, and proposed a new methodology to manage innovation projects. Chen (2007) employed multi-criteria decisions, Kano model and the concept of levels of user's satisfaction in the case studies of water bottle and handset designs. Results proved that the application of the Kano model and user's satisfaction inference model can assist designers to resolve the multiple attributes of the product sensitivity design, so as to effectively enhance satisfaction levels. Hsu et al. (2007) explored the service needs of airline passengers, and found that service elements can be classified into the quality categories similar in the Kano model, in order to identify the most important service qualities. The quality characteristics that influence the satisfaction of passengers can also be improved with prior planning. Wu (2004) combined the Kano model with fuzzy theories to examine how digital camera users perceive functions and qualities. The study found that most of the perceived qualities are indifference qualities. Also, users of different backgrounds have significantly varying views on the quality characteristics of digital cameras. In

sum, the Kano model provides a new analysis method in the design development or positioning of quality elements so as to closely link design quality and satisfaction levels. Also, it establishes an understanding of the variances in essence and degree of different quality characteristics, in order to improve the design methods and degrees that influence the levels of users' satisfaction.

3. Research Design

Research design includes four stages, as described below:

(1) Stage 1: Website evaluation and sample selection

According to report of InsightXplorer Limited (2009), the order of website industries with the highest average visiting rate of users in Taiwan is portal sites (98.3%), blogs (87.6%) and search engine (77.5%). The 2010 report indicated the order below: portal sites (72.8%), search engine (53.9%) and blogs (48.1%). Since service of portal sites includes search function, this study focuses on portal sites and blogs. In addition, according to Alexa (2010) regarding daily network flow in Taiwan on July 15, 2010, among portal sites, Yahoo! is the highest (119,825 person-time); among blogs, Wretch is the highest (22,075 person-time). Thus, this study treats Yahoo! and Wretch as the samples.

(2) Stage 2: Kano's two-directional questionnaire design

The questionnaire is based on Huang & Guan (2010) constructed the website quality assessment model, and consists of the questions with positive and negative statements.

(3) Stage 3: Subjects of questionnaire

According to a survey by TWNIC (2010), the most Internet intensive users in Taiwan are the people with at least university education (95.71%). Thus, By purposive sampling and non-repetitive method, this study investigated 70 university students with website visiting experience regarding Yahoo! and Wretch. Paper-based questionnaires are issued in classrooms, and collected after the respondents provide their answers.

(4) Stage 4: Result analysis and modification.

a. Quality attribute classification: The cross comparisons shown in Table 1 indicate the results of the characteristics, such as attractive quality, one-dimensional quality, must-be quality, indifference quality, reverse quality or ineffective quality. The analysis on the recovered and effective questionnaires provides a breakdown of the different characteristics for the six qualities. The classification is based on the highest number of accumulative counts. Since the questions are in-depth, this paper applies the criteria proposed by Berger et al. (1993) as the final determination base. If (O+A+M)> (I+R+Q), the maximum value of the set (O, A, M) is used. Otherwise, the maximum value of the set (I, R, Q) is used.

b. Coefficients of quality improvements: The calculation is based on the number of accumulative counts for the six qualities according to the survey results, and the users' satisfaction coefficients developed by Matzler & Hinterhuber (1998) (see Eq. (1) and Eq. (2)).

4. Results and Analysis

4.1 Respondents' composition

After eliminating invalid questionnaires, 61 valid questionnaires were retrieved for Yahoo! and Wretch

respectively. Statistical results of respondents in two groups showed that for the two groups, most of them are females (62%, 72%), 18~25 years old (96%, 98%), graduated from universities (96%, 98%), have online experience for over five years (62%, 64%). As for average daily online time, Yahoo! respondents mostly spend 1~3 hours (28%), while Wretch respondents mostly spend 3~5 hours (46%). Hence, it can be inferred that most respondents are equipped with sufficient experience and knowledge to make judgments and answer the questions properly.

4.2 Quality Attribute Classification

Based on the literature review for the classification of quality elements, this study combined the majority votes suggested by Kano (1984) and the modification developed by Berger et al. (1993) in the selection of the quality attributes different quality characteristics represent. For example **Table 2**, one of the basic communication factors of the visual dimension is the consistency in overall color tones. An analysis on the Yahoo! 61 effective questionnaires found that, there are 4 for attractive quality (7%), 24 for indifference quality (39%), 15 for must-be quality (25%) and 18 for one-dimensional quality (30%). Given (O+A+M)> (I+R+Q), this study adopted the maximum value of (O, A, M), and hence determined that one-dimensional quality (O) is the result. The original result was indifference (with the most counts). The same principle applies to other attributes. Details are shown in Tables 2~4.

(1) Visual dimension

Investigation result on Yahoo! shows that "must-be quality" is related to the characteristic to avoid visual fatigue. It is inferred that texts and images on the website are rich with diverse visual effects which result in users' visual burden. Therefore, the balance between information expression technique and users' visual loading is important; characteristic of "one-dimensional

quality" is related to users' browsing habit, and it demonstrates users' value on human layout design. In addition, "attractive quality" is related to visual aesthetics of layout, indicating that portal sites with rich design are important to for users. A good design can please the users. Investigation result on Wretch shows that "must-be quality" is the same as Yahoo!; "one-dimensional quality" is associated with layout of images or texts. It is inferred that blog is one of the media for most users to share their personal and subjective information with the public. Thus, information expression will influence users' satisfaction; "attractive quality" is the same as Yahoo!. This study infers that since blog is one of the platforms for most users to exchange with others or express the feelings, different styles of layout not only indicate users' mental states, but also demonstrate their personal taste. Therefore, most of bloggers will pay attention to aesthetics of layout in order to maintain the visitors.

(2) Usage dimension

Investigation on Yahoo! demonstrates that most of characteristics ("must-be quality") are regarded to maintain basic browsing function of websites or help users to accomplish the task. It shows users' strong demand and value on use characteristic of portal sites. After all, Yahoo! is the homepage of browsers for most users. Failure of connection to Yahoo! will be inconvenient for users. In addition, "one-dimensional quality" is mostly in two factors (diversity and manipulation), demonstrating users' expectation of changeable Yahoo! and the rise of users' autonomy in usage. The maturity of Internet technology can enhance users' participation in creation, and be one of necessary quality characteristics of portal site. "Must-be quality" of Wretch is similar to Yahoo!, indicating that for the most must-be quality). Finally, no characteristics of Wretch are defined as "attractive quality". It shows users' highly demand for use quality. With the progress of Internet technology, some characteristics that are used to

stimulate users in the past have become basic quality characteristics.

Table 2. Yahoo! and Wretch Customer Satisfaction Coefficients for Assessed Characteristics of Visual Dimension

Dimension	Factor	Assessed characteristics	Yahoo!		Wretch	
			satisfaction coefficients	dissatisfaction coefficients	satisfaction coefficients	dissatisfaction coefficients
Visual Dimension	Basic communication factor	Avoidance of any characteristics that may result in visual fatigue for users	.28	.69	.26	**.68***
		Avoidance of overuse of moving texts	.36	**.75***	**.30**	.57
		Avoidance of too many texts on one page	.36	.54	.23	.46
		Consistency in overall color tones	.34	.33	.26	.34
		No more than three fonts available	**.43**	.34	.21	.18
		Appropriate implications for links	.36	.51	.25	.54
		Spacing and line distance	.36	.59	.21	.49
		Appropriate font sizes	**.43**	.67	.20	.59
	Style aesthetics	Aesthetics in overall layout and design	.64	.43	**.61**	.28
		Attractive titles and pictures	**.67**	.31	.48	.27
		Consistency of background design, colors and major visual icons	.64	**.52**	.39	.39
		Consistent visual styles overall	.51	.34	.28	.43
		Consistency in interface design elements	.44	.54	.31	**.57**
	Layout setting	Provision of personalization setup mechanisms	**.69***	.33	**.64***	**.72**
		Clear navigator components	.44	.52	.34	.48
		Default resolution compliant with computer screens of most users	.56	**.74**	.38	.62

satisfaction coefficients=(A+O)/(A+O+M+I)   dissatisfaction coefficients=(M +O)/(A+O+M+I)

*indicates the highest coefficient of overall dimension and Bold indicates the highest coefficient of different items.

(3) Information dimension

Investigation result demonstrates that users tend to treat information provided by Yahoo! as "must-be quality". It is inferred that since content of Yahoo! is rich, and it is the channel for most of the people to search for and acquire new knowledge every day. It is important to maintain precision and safety of website information users, basic browsing function of different kinds of website is the necessary design quality. In addition, in comparison to Yahoo!, "one-dimensional quality" of Wretch includes ease of use, diversity, consistency and hints. It is inferred that blogs are presented by web page design. Thus, use quality can influence users' satisfaction, and further affect their re-visit intention (although it is unlike portal sites with quality regarding users' satisfaction. Moreover, "one-dimensional quality" is the characteristic to allow users to read and comprehend website information. This study infers that since website provides rich information, and it can help users to effectively accomplish the goal, it is the key

characteristic on users' satisfaction. "Attractive quality" demonstrates that users expect to acquire professional knowledge needed from websites. Thus, it is suggested that websites can construct customized information content according to needs of different groups.

"Must-be quality" of Wretch is related to propriety and safety of information. It is inferred that since blogs are new media for users to show the content and share information, "must-be quality" is more important than other quality characteristics. "One-dimensional quality" of Wretch is similar to Yahoo!. Noticeably, attractive factors of Yahoo! are treated as "attractive quality" whereas those of Wretch are treated as "one-dimensional quality". It is inferred that since blogs can present and share users' personal views, bloggers demand more for information quality of blogs than other types of website.

4.3 Quality Improvement Coefficients

This study applied the users' satisfaction coefficients developed by Matzler & Hinterhuber (1998) to analyze the statistics of the Yahoo! 61 effective questionnaires. For example **Table 2**, One of the basic communication factors in Visual Dimension, "avoidance of any characteristics that may result in visual fatigue for users", account for 3 in attractive quality, 16 in indifference quality, 28 in must-be quality and 14 in one-dimensional quality. The result of Eq. (1) shows the value of 0.28 for the increase of satisfaction coefficients. The calculation of Eq. (2) indicates the value of 0.69 for the decrease of satisfaction coefficients. The same principle applies to other attributes. Details are shown in Tables 2~4.

(1) Visual dimension
For Yahoo! or Wretch, the highest coefficients of satisfaction and dissatisfaction refer to the same factor. The analysis shows that satisfaction coefficient of "basic communication factor" is low and dissatisfaction coefficient is the highest. This indicates that the factor should be significantly improved. After examining these two types of website, it is found that besides images and

texts, animated advertising is part of website content. Users will easily feel uncomfortable in browsing. Satisfaction coefficients of "style and aesthetics" and "change of layout" on two kinds of website are higher. However, noticeably, regarding "change of layout", dissatisfaction coefficients are higher than satisfaction ones. Moreover, although two types of website provide users with self-constructed layout, the change is insignificant and ineffective; thus, they cannot meet users' expectation.

(2) Usage dimension
According to satisfaction coefficients, score of "diverse media use" in "diversity" of Yahoo! and Wretch is the highest. However, satisfaction coefficients of use are not high and dissatisfaction coefficients are higher than satisfaction ones, indicating that use of two types of website should be improved. Among dissatisfaction coefficients, Yahoo! and Wretch both reveal the highest score on "connection is smooth in browsing" of "stability". It is inferred that since Yahoo! is the homepage for most browsers of users, hence, the connection quality is critical in browsing and search. Failure in connection will be inconvenient for users. Moreover, blogs are the platforms for bloggers to write articles or upload data; hence, unstable connection quality will stop users' editing. Although Yahoo! and Wretch are rarely off line, the occasional incidents may be memorable to users. It shows that users pay serious attention to website connection quality. In addition, noticeably, for Yahoo! or Wretch, score of satisfaction or dissatisfaction coefficients of "hints" is below 50%. It is because the hint design of websites is inconsistent. Thus, when browsing, users cannot construct mental model; instead, they will try to click on images or texts without connection hints. Therefore, they will not care about connection hints function on websites.

(3) Information dimension
The highest satisfaction coefficient of Yahoo! is "depth

and breadth of information content" of "attractive factors". It is inferred that since Yahoo! provides multiple information, it is one of the important channels for most of people to have knowledge learning, expansion and share. The highest satisfaction coefficient of Wretch is "quick and efficient response to problems" of "response". However, the score of dissatisfaction coefficient is higher than satisfaction coefficient, indicating that more users suggest that the factor should be improved. "Propriety" reveals higher score of dissatisfaction coefficient on Yahoo! and Wretch. It shows that in comparison to other media, users demand more for website information content. After all, websites are known for their immediate and limitless characteristics, and portal sites and blogs are important media for most of people to acquire information. Thus, users have more expectation. In addition, regarding "quick and efficient response to problems" of "response", dissatisfaction coefficients of two types of website are high. It is inferred that since portal sites and blogs are important media for the majority to deal with daily affairs or communicate with people, without rapid and efficient problem solving, websites can cause significant loss for users or firms.

Table 3. Yahoo! and Wretch Customer Satisfaction Coefficients for Assessed Characteristics of Usage Dimension

Dimension	Factor	Assessed characteristics	Yahoo!		Wretch	
			satisfaction coefficients	dissatisfaction coefficients	satisfaction coefficients	dissatisfaction coefficients
Usage Dimension	Stability	Smooth connection and no disconnection during browsing	**.49**	**.85***	.33	**.87***
		Able to connect to other servers (websites) smoothly	.36	.79	.38	.79
		No long waiting times when connecting	.41	.82	**.54**	.82
		Support for mainstream or well-known brewers	.36	.77	.33	.77
		Hyperlinks connecting to the correct webpages	.36	.79	.34	.80
		Good search results	.43	.66	.51	.52
	Visibility	Easy to read and recognize the coloring of texts and backgrounds	**.43**	**.61**	.25	**.63**
		Ease of browse due to website layouts and designs	.39	.57	.31	.49
		Obviousness of the frequently-used functions	**.43**	.56	**.39**	.41
	Controllability	Avoiding asking users to install additional but uncertified software for file downloading	.46	**.66**	.34	.56
		Support for different languages	**.54**	.41	**.51**	.38
		Allowing users to control the information access quantity	.52	.54	.49	.51

	Allowing users to control the browsing speed	.51	.54	.33	**.57**
	Search methods in line with general practices	.46	.54	.43	.46
	Internal search functions	.37	.57	.28	.56
	Optimal time required to finish searching	.36	.64	.21	.51
Undo-ability	Function of returning to the previous step	.31	.79	**.20**	.67
	Function of returning to the previous page	.30	**.85***	.15	**.70**
	Link to the home page	**.34**	.82	.16	.66
Usability	Avoidance of highly complex learning process for users	.33	**.64**	.36	.57
	Avoiding opening too many pages when linked	.36	.52	.38	.48
	Avoiding displaying both vertical and horizontal scrolls on the page	.34	.51	.28	.30
	Assist users to learn new knowledge through task searching	**.59**	.56	.44	.36
	User-oriented design as the core of design	.43	.56	.43	.52
	Brief time required to learn how to operate for first-time users	.46	.70	**.51**	.59
	The procedures and number of pages for completing the task searching are appropriate	.39	.56	.36	.54
	The classification of the structure is logical	.26	**.64**	.21	**.72**
	The length of the page is design for the convenience and completeness of printing and saving	.49	.48	.44	.49
	The number of layers in the link menu is appropriate	.36	.46	.48	.51
Multiplicity	Variety of media applications	**.64***	.43	**.57***	.41
	Multimedia applications	.59	.51	.54	.48
	The interaction between the users and webpage media is smooth	.49	**.56**	.40	**.56**
	Supplementary function to assist in browsing	.36	.38	.46	.33
Consistency	The presentation of the link selections is consistent	.36	.48	**.26**	.43
	The coloring of the hyperlink text is consistent	.26	.34	.16	.44

Dimension	Factor	Assessed characteristics				
		The overall browsing method or operation is consistent	**.39**	**.57**	.23	**.56**
	Authority division	Website owner (e.g., company owner) has the authority to close or launch the website	.12	.49	.17	.59
		The interface has division of authority based on the levels of the users (e.g., regular members, free members, etc.)	.19	.36	.10	.30
		Allowance website managers(e.g. moderators) to delete improper information	**.28**	**.51**	**.36**	**.61**
Usage Dimension	Suggestibility	Images have substitutive descriptive text, in case the images are not shown properly	**.42**	.47	.31	**.44**
		The coloring of the hyperlink text is different	.35	.42	**.33**	.31
		Images or text with hyperlinks have implied indications	.31	**.49**	.30	.34

Satisfaction coefficients=(A+O)/(A+O+M+I).   Dissatisfaction coefficients=(M +O)/(A+O+M+I).

*Indicates the highest coefficient of overall dimension and Bold indicates the highest coefficient of different items.

Table 4 .Yahoo! and Wretch Customer Satisfaction Coefficients for Assessed Characteristics of Information Dimension

Dimension	Factor	Assessed characteristics	Yahoo!		Wretch	
			satisfaction coefficients	dissatisfaction coefficients	satisfaction coefficients	dissatisfaction coefficients
Information Dimension	Feedback	Response speeds for problem solutions, fast and efficient	**.48**	**.72**	**.62***	**.79**
		Mechanism to guide users in the searching process	.34	.61	.33	.70
		Confirmation for sending out information	.41	.54	.38	.53
		Clock ticking to indicate downloading progress or remaining time required when connecting	.39	.57	.43	.41
		Alert messages for a wrong operation	.44	.69	.30	.69
	Attractiveness	Offering incentives (e.g. bonus points or giveaways) to attract users	.37	.21	.33	.08
		The depth and breadth of information	**.66***	**.46**	.38	.28
		Contents addressing the specific needs of users	.46	.44	.41	**.44**
		Links relevant to the website contents	.48	**.46**	**.44**	.28
		Previews of future information	.39	.31	.38	.25

Fitness	Provides the correct information immediately	.43	.72	**.57**	.66
	Presentation of accurate information	.38	**.84***	.46	.75
	Wording addressing the main target audience	.34	.51	.23	.44
	Logical content organization or editing	.41	.56	.26	.43
	Appropriate allocations to advertising info	**.44**	.66	.30	.67
	Menu selections easy to understand	**.44**	.80	.31	**.84***
	Appropriate information classifications	.28	.59	.23	.52
	Relevance of information contents to website attributes	.34	.67	.16	.51
Safety	Avoid outdated contents that should be updated but failed to be updated	.34	**.70**	.23	**.66**
	Presentation of suitable information	.41	.69	.28	.62
	During programming, avoid recording sensitive personal information in cookies	**.49**	.66	**.34**	.59
	Website owner (e.g., company owner) has the authority to remove improper information	.33	.41	**.34**	.64
Indication	Indication of the current page which the user is browsing	.31	**.52**	.34	.33
	Site map or service guide	.46	.49	**.38**	.18
	Highlighted indication for important information	**.52**	.48	.36	**.39**
Reliability	Website classification systems	.34	.46	.26	.25
	Provide sources of information, and the notice for updating dates	**.51**	.51	.36	.46
	Provide copyright, privacy, and information security notices	.38	.60	**.43**	**.61**
	The website name or related information is shown on the webpage	.43	**.61**	.33	.41

Satisfaction coefficients=(A+O)/(A+O+M+I).   Dissatisfaction coefficients=(M +O)/(A+O+M+I).

*Indicates the highest coefficient of overall dimension and Bold indicates the highest coefficient of different items.

5. Conclusionon

One of the purposes of the study is to prove the Kano model can be used to identify different types of Web sites, and therefore, greater differences between the two types of Web sites are selected for investigation. Portal site is one of the important media for modern majority to interact with external world. With development evolution for years, it has evolved from the channel of website connection in the past to one of the important

destinations visited by online users. Blogs are not only the platform for users to record in the information, but also are interactive and allow users to share information. It increases the users' Internet attachment. Finding of this study demonstrates that quality characteristics of Yahoo! are mostly treated as "must-be quality" (51%) and the following are "one-dimensional quality" (32%), "attractive quality" (14%) and "indifferent quality" (3%). There is no "reverse quality" (0%); quality characteristics of Wretch are mostly treated as "one-dimensional" (59%) and the following are "must-be quality" (38%),"indifferent quality" (2%) and "attractive quality" (1%). There is no "reverse quality" (0%). As to satisfaction coefficient, the highest average score of Yahoo! is "vision" (0.47) and the lowest is "use" (0.40). The highest dissatisfaction coefficient is "use" (0.58) and the lowest is "vision" (0.53); as to satisfaction coefficient of Wretch, the highest average score is "information" (0.35) and the lowest is "vision" (0.40). The highest dissatisfaction coefficient is "use" (0.54) and the lowest is "vision" (0.33).

Based on the above, it is inferred that since portal sites are better than blogs regarding development years or services, and they are the homepage of browsers, users highly evaluate the quality. With diverse services in recent years, blogs gradually accumulate the operational base and become one of the popular websites for users. Therefore, although users do not demand for must-be quality of blogs as much as for portal sites, one-dimensional quality of blogs can also influence users' emotion. It demonstrates users' expectation for blog design. Moreover, noticeably, users criticize the most for use of portal sites and blogs. It shows that although website use is developed and studied for years, it cannot be effective and cannot meet users' expectation. It should be valued by related researchers and designers.

Finding of this study demonstrates that because of different functions, different types of website reveal different design points and requirements in construction.

Although there are many past researches on website design, this study finds that, according to the finding that users' dissatisfaction coefficients are higher than satisfaction coefficients, current website construction should identify value of design characteristics instead of simply judge the advantages and disadvantages of characteristics. Thus, there will be more specific criterion of design.

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Why Are Players Being Immersed in Online Game? A Study on the Game's Creating Value of Emotion for Players

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This empirical research investigated the online gamers' creating value of emotion. The study scopes on online game players' emotional cognitive factors, flow experience, and consumption desire, which are included in our research model. This research method adopted empirical statistical analysis to examine the above constructs. This research takes 293 participants as the subjects for supporting our empirical research. The rate of this survey's efficiency is 86.94 %. Reliability analysis of which it showed that all of variables Cronbach's α coefficients ranged from 0.73 to 0.93, the questionnaire thus concluded reliable validation of information for our research. The results showed that game's creating value of emotion can enhance to strengthen the players' attention span on game for next consumptions.

Keyword: Online game, creating value of emotion, flow experience, attention span

1. Introduction

Digital games have been changed greatly over the recent years. As Rovio (a mobile game company) and Zynga (a web game company) are becoming more successful, Nintendo, and SONY propose new machine scale strategies to show change from some international merger plans. In the meantime, opportunities and challenges are countless accompanied by the above phenomenon. According to a game industry survey during 2011, the global population of people who engage in digital game is over 3 hundred million, with a market size of more than 600 billion U.S. dollars. The revenue from online game is accounting for about 30%, television and handheld games are accounting for 50%, mobile games are accounting for 15%, and computer games are accounting for 5%. Although the major global market is mainly television and handheld games, online game is still the main industry in Taiwan. In 2011, Taiwan's online game market is amounted to NT $ 15.9 billion, with the game population of over 500 million people. Currently, the market is mature and highly competitive, having over 150 companies that create games. Thus, the market is filled with hundreds of online game products each year (as figure 1). Moreover, with the high sales of mobile phones and tablet PCs, a huge impact and change has been caused on the global game industry. Cross-platform games have become a major trend of the game industry (MIC, 2011).
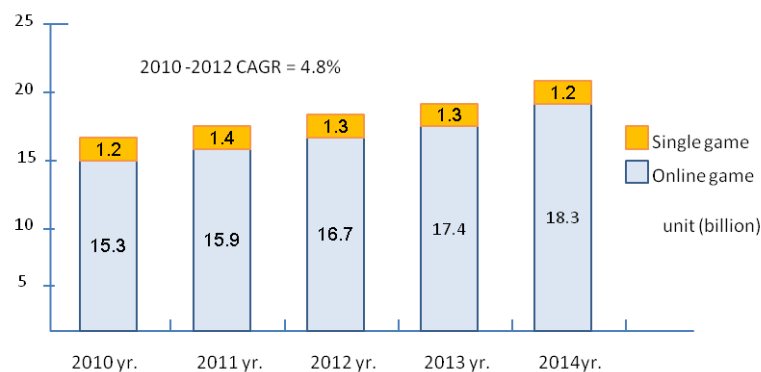

Figure 1. the scale of digital game market of Taiwan Resource: MIC (2011)

Referencing the MIC's announcement about the production value statistics of global game industry, online games had a surprising increase in its production from 2007 to 2011. The rate of the Compound Annual

Growth Rate (CAGR) would reach 4.8% in Taiwan (MIC, 2011). Taiwan's online game industry has been experienced in its marketing for long time since 2000. Especially from 2002 to 2003, a startling increase has been produced that caused a high explosive growth in its production effect over a short span of one year. From the game market revenue aspects, the benefit was 95.6 billion dollars in 2005; by which to compare with the profit was 105.9 billion dollars in 2006; online games still have space to grow although it could face the industry in the state of saturation. In Taiwan, the online game market is nearing saturation; game companies still announce new products for sharing the market constantly. The profit margins were limited; players thus met a problem of high homogeneity with new games.

The components of online games include planning, art, programming, music, service and marketing. The context of the game could provide players enjoyment with background, sound and light stimulation to experience a virtual world full of surprises and fantasy. We shall be exploring the core value components of online games for further creating the value of fantasy, adventure, treasure, marketplace transactions, new virtual communities, and social mechanisms of the players.

Creating an online game requires a so-called dominant value, which provides scenes, characters, props, activities, background music and so on to the players. The players could enjoy all these elements as being living in its situation when playing the game. On the contrary, the emotional value refers to players' spiritual experience through the player's cognitive level within the game (the background story, play arrangements and knowledge in challenge barriers), are what makes it interesting (challenges, interaction, and self-fulfillment, etc.), and the values of Maslow's "need-hierarchy" theory, such as a sense of belonging, a sense of achievement, and a sense of sharing joy, etc. Therefore, the creation of value for online games is the successful element of game market share; in the meantime, creating a brand new value could be an effective way to attract the players to replay the game.

We will then make an empirical study for the research which is focused on the model of players' creating value of emotion. In the meantime, expanding the player's creating value of emotion model to verify players' attention spans of the game are the core values that should be examined. The research model consists of "Team spirit", "Joy is sharing", "Self-fulfillment", "Peer recognition" and other emotional values and elements on demands.

The conducted research explored as following:

(1) Testing the influence of the creating value of emotion on players' attention span.

(2) Testing the influence of the creating value of emotion and the flow experiences on players.

(3) Testing the influence of players' creating value of emotion on the consumption desire.

The contributions of this paper are presented as follows:

(1) We proposed the empirical testing model of the creating value of emotion influence on the players' attention span.

(2) The research model regards the players' creating value of emotion including the players' belief, flow experience and the attention span as the input factors to empirically verify players' consumption desires. It is distinguished with the other empirical research articles for online games which focused on the enjoyment of the game. One's assumption would be more close to the players' cognitive thoughts and behavior, which can obtain an accurate conclusion for why players are easily immersed in online game?

(3) The conclusion of this paper can provide game business strategies for game corporations to consider.

2. Literature review

2.1 Online games

As technology continues to develop, online games came into being as innovation combined with sound, light, movement and images. Online games can contain thousands of players so as to provide users a way to create their own online virtual world. In terms of its content, online games currently on the market can be divided into two categories; "role-playing game" and "real-time strategy game". Role-playing games are referred to as "RPG" which means the player will be able to interact and play a role with other users in the game. Users then have their own virtual network interactions through the internet media. RPG games have many different types of characters, the features of which the user needs to train the character to certain experience levels to upgrade to higher levels, learn new magic, skills, increasing their HP (Health Point), MP (Magic Point), and power. There are three main features in the design of RPG which as its structure, interface and adventure trip: character attributes, combat strategies and level design. "World of Warcraft" is this type of RPG online game is what this research chose to proceed and explore.

Online games are different from the daily necessities or services, especially in aspects of which includes the cost structure of product development, consuming behavior, business model and the market acceptance. Therefore, this research by which to explore the consumer's preferences and its various aspects as follow (Chiu and Chang, 2006):

- Special cost structure - great development costs, high operating costs, and the agency costs are more expensive.
- Experiential products – for players that appreciate the value of products, which depends on the players' experiences in playing game. Usually the period is three months when a new product announces for players to experience. Until to third month, the population of game players will not grow anymore.

- Revenue model based on the time in playing game - players stay on the game longer, the game will earn more profit. Therefore, the attention span of online gamers, system stability and service are the critical operations concern to game companies.
- Consumer-exclusive – a player immersed themselves in a game, there were no other products can be consumed by the player at the same time. Online games thus have the time-exclusive property.
- Population of community has the snowball effect - the community operation of game is the key factor of game market acceptance. The larger the community in a game, the life cycle will be longer. In contrast, when community population is sparse, the game will fade out quickly.

Hsu and Lu (2004) referred the technology acceptance model (TAM) that was widely used in predicting the user's acceptance of information technology, incorporation of social influences and flow experience as belief-related constructs to analyze influence factors of online games. This article surveyed 233 users of online games, the research resulted an illustration of the players' personal experience in "social norms". Since they participated in online games; the players experienced the game's "perceived usefulness" with their "preference attitude", to which the player's "cognitive critical mass" and "flow experience" would affect their participation in online games attitudes.

Lo(2004) used 1124 questionnaires filled by online game users, the results of which shows the creating value factors of online game effect the generation of customer feeling. However, the definition of creating value in his thesis includes: product, novelty, sense of control, price, brand, service, sense background information, system speed, convenience, experience and entertainment, and social and psychological benefits. Since he mentioned most of value factors of the thesis as the explicit factor, this research thus suggests that the depth exploration of the players' inner thought should be mainly concerned

for the creating value of online game.

2.2 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is derived from the "Theory of Reasoned Action Model" (TRA; Fishbein and Ajzen, 1975). TRA stresses that someone's specific behaviors can be affected by his own personal cognitive, attitudes or ideas; TAM provided user's acceptance analysis of information technology as to be generalized cognitive behavioral theories. Previous articles have demonstrated the validity of this model across a wide range of IT (Davis, 1989; Davis et al., 1989).

TRA was first proposed in 1967, it argued about behavioral intentions concerning the voluntary decision measure from a social psychology standpoint (Ajzen & Fishbein, 1980). The goal of TRA is to predict an individual's belief, attitude, intention, and behavior. TAM is an explanation and measurement tool to predict the user's acceptance of information technology. So, it has widely used in a variety of new products or new technology application researches, especially the products on internet. It is an adaptation according to the TRA. Davis' (1989) TAM explored the reason, emotion and the relationship between the use of technology, which was derived from the original TRA model that proposed by Fishbein & Ajzen(1975). This model is a concept and belief, which can realize the user's behavior to the new technologies via the user's perceived ease-of-use and perceived usefulness. The goal of TAM is to simplify the TRA, in order to find a more effective prediction model. TAM is especially suitable for the interpretation of users in the application of information acceptance, the model would not only explain the user's acceptance and behavior in using the information system, but also can be used to analyze the factors of affecting the user acceptance (as seen in Fig. 2).

TAM's theoretical basis to understand the external factors on the effect of users' internal beliefs, intentions and attitudes, in terms of the affecting of the use of technology. This model can explain users' behavior of accepting the new information system or digital media; it also can be used to analyze the various factors of users' acceptance situation in the meanwhile. However, most of the players hold their own intrinsic motivation, thus gain the sense of pleasure and inner satisfaction by means of playing game. Therefore, in response for the internal use experience of digital media, the TAM model would need for extension and revision for specific contexts (Kaasinen, 2005; Luo & Strong, 2000; Moon & King, 2001; Yu, Ha, Choi, & Rho, 2005).

Recently, articles featuring online games regard that the players sense of enjoyment comes from their individual intrinsic motivations (Davis, Bagozzi, & Warshaw, 1992). That is to say, the players' pleasures are generated come from their own intrinsic satisfactions when playing games. Moon and Kim (2001) proposed the perceived enjoyment of cognitive personal intrinsic motivation. They regarded that this may affect the users' attitudes and willingness of using network-related entertainment or systems. This study suggests that the intrinsic motivation in online gaming must consider the user's perception such as ease-of-use and usefulness of TAM model. The interaction process triggered by flow experience is also a critical factor of empirical testing in the internet era. And is thus, some studies have been aimed at intrinsic motivation constructs, such as perceived enjoyment as one of the critical factors that could influence the users' behavior (Venkatesh & Morris, 2002; Teo, Lim, & Lai, 1999).

From a motivational perspective, gaining pleasure and satisfaction from performing a behavior (Deci & Ryan, 1987), in online games are achieved by having specific goals/rewards inside the game (Vellerand, 1997). Therefore, perceived usefulness in the TAM model can be regard as the "Perceived Meet Achievement" for players in online game.
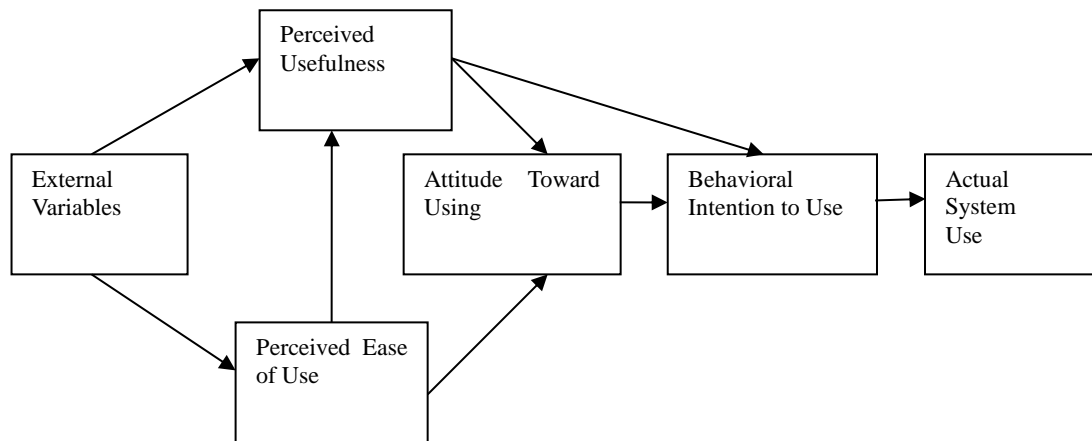
Figure 2. Technology Acceptance Model (Davis, 1989)

2.3 Flow experience

Csikszentmihalyi (1975) first introduced the flow experience of academic research, the definition of which was forwarded to as the flow theory. Nonetheless, his declaration had been challenged and revised by Massimini and Carli (1988), the flow experience thus appeared more stringent, so as to form the concept of a structural model. Csikszentmihalyi (1975) issued that when people carry out an activity with concentration of attention, awareness of integration into a situation, the human is immersed into a flow state without awareness of what is happening around them. In this state, the individual will not be distracted. There are four statuses thus raised, this explains of which as follows:

1. Attention: this state refers to that individuals will focus attention on specific stimuli so as to enter a flow state.
2. Loss of Ego: by making the pursuit of common goals so as to achieve in group activities, individuals can co-operate with the behavior of others.
3. Control: the consciousness of which is thus being controlled by the environment of a virtual reality.
4. Intrinsic interest: the individual's behavior does not need external stimuli; their awareness is narrowed to the activity itself, to which the

players' concentration is immersing into the game.

Hoffman and Novak (1996) noted that in the multimedia era, users are immersed in an interactive context so as to create flow experience. The situation is similar as the theory of flow experience. In the article, flow theory is often adopted in online learning. In research, flow has also been studied in the digital content area; it has been recommended as useful in understanding consumer behavior (Karahanna and Straub, 1999). Moon & Kim (2001) constructed a model: extend-TAM including the "Perceived Enjoyment" which is based on "Flow theory". We proceeded to explore the "Perceived enjoyment" of online games via the users' acceptance of the internet. "Perceived enjoyment" would be a factor that reflects the players' flow experience in online games.

In a related article, it showed that players would immerse in flow experience by playing the games (Hsu & Lu, 2004). They regarded that "flow" is defined as an extremely enjoyable experience, where an individual engages in an online game activity with total involvement, enjoyment, control, concentration and intrinsic interest. Their own unique characteristic of online games itself could cause users immersing in the flow experience. If the users are motivated when playing an online game, the easier it is to engage in flow experience. Also, users who have high cognitive online

game features, have higher flow experience levels. That is to say, the depth the user's experience in the flow experience is higher than normal and mild experienced users. Higher the flow's experience level, the more attraction in playing. Users can easily lose self-awareness when they pay their full attention to involve a game, other ideas will be totally ignored by its flow experience. Online games provide users a sense of accomplishment and satisfaction, and produce the mental status of fun, which is why the user is easy to immerse within the online games.

Based on the above, we used the theory of "flow experience" to examine the user mental experiences when playing online games which causes the users to go to a state of immersion; their awareness level is narrowed down to the activity itself, and lose self-awareness in the real world. Thus, the "flow experience" can be treated as a construct within our empirical model, thereby affecting the users' "Perceived enjoyment". To sum it up, we proposed that the construct of "flow experience" as an influence factor of "Perceived enjoyment" into our model.

2.4 Creating value

Lo (2004) pointed out that for keep the players staying on game; "creating value" is the main concern. The "value" is derived from the service and product itself, which includes the function, qualifies, advantages, and so on. The function option provision also can create the value of production; this phenomenon is especially distinct in web environment. However, he suggested that, creating value, customer experience, value acquirement, the products and service, including the features, quality, and benefits are all the factors could attract the players to keep staying on the game with an immersed situation.

Jerry, et al., (2002) proposed a discourse of the elements that argues about creating value, the "value" of which is not only limited to product's price, which is obviously and measurable, but the important is experiences in the consumption process for consumers.

For online games, the creating value for games include social factors, such as: "Peer recognition", "Team spirit", "Joy sharing" and "Self-fulfillment". As Maslow pointed out, the needs of human pursuit, the satisfaction and values such as: 1. Physical needs, 2. Security needs, 3. Belonging, 4. Self-respect and respect for others, 5. The self-fulfillment, 6. need for knowledge, and 7. Aesthetic needs (Maslow, 1970). Through the process of product consumption, the value is created when products meet the requirements of consumers. Based on the above viewpoint, the meaning of creating values in online game, it is not only the explicit property, such as product, novelty, sense of control, price, service, and so on. The players also based on entertainment experiences to create benefits to meet their psychosocial needs, and ultimately the self-fulfillment of human pursuit as well.

In Maslow's theory of motivation, motivation refers to human activities with intrinsic drive. Humans go toward a particular goal in order to satisfy the mental and physical need by their intrinsic drive. Maslow stated that human motivation is with different layers, in which it is continuous, endless, undulating, and complex (Maslow, 1970). He divided motivation into three parts: lack of motivation, growth motivation, and beyond the motivation. People will have different needs by three different motives. People seeking to satisfy their requirements in the course of individuals will gradually mature; in the meanwhile, the personality will gradually improve along with their mental health.

This paper is aimed to examine the third, fourth and fifth needs Maslow had defined: Belonging, respect and self-fulfillment - the hope to gain acceptance from other people so as to become a member of a team, avoiding solitude, loneliness, or isolation. Human beings are social animals with emotions, thus, the need to be loved emerges when gain the physical satisfactions and security needs are fulfilled. Then, interpersonal relationship is thus constructed. This type of sense of belonging includes the hope to be accepted by other

peers, interpersonal relationship and building of social skills. Secondly, this research proceeds to discuss the need of self-fulfillment. In order to realize potential and helping others grow, Maslow focused on growth and development to help human beings to build their realized individual goal and personality.

Human beings would realize they want to be self-respected to be self-accepted. Then, they could develop and realize their true potential and personality so as to be an ideal individual. "What a man can be, he must be". That is to say, it would be a wish of self-fulfillment which as a tendency toward potential realization that help each man becomes more unique.

Finally, the need of knowledge and its understanding is a cognitive aspect, as Maslow argued that humans would feel joy and happiness with the process of exploring, analyzing, explaining, and understanding the truth with curiosity. At the same time, its impulse could evoke a system of knowledge and value for individual construction. The need of knowledge is not only the fundamental of growth, but to also eliminate the anxiety as well as balance the protection (Maslow, 1970). The internet provides a chance to create self-fulfillment in the virtual community of online games. The users would hide their identity by not using their real name and can decide their interactions to present themselves to share with other users. This is, to build one or multiple persons in this virtual community（Lyman & Wakeford, 1999）. The pursuing spirit of satisfaction and sense of achievement for online games players is by realizing the players' emotional requirements（Liu, Fang, Chang and Hsieh, 2007）. Based on the above, the research then claims four constructs of the external factors of creating value of emotion: "Team spirit", "Joy sharing", "Self-fulfillment" and "Peer recognition" which combines the constructs of the research model. What is more, Aldler & Christopher stated when users has the sense of royalty to the team, their presentations are delineated as followed: （1）the

sense of desire to be one within the group;（2）the sense of belong to the group;（3）a strong desire of being a part of the group; （4）an effort to contribute;（5）an obedience to the group's rules and guidance（Aldler & Christopher ,1998）.

2.5 Attention span

The term of attention span refers to the amount of time the players stay on the game and its level the players immerse in. The longer the player stays, the higher the level of attention span, and in the meanwhile, the attention span is higher if the game could provide a sense of fresh to the players. In addition, players must take a lot of time to accumulate their experience of level, which is one of the reason to cause a higher attention span for the player. The process of consumption could create the satisfaction in the different needs of the players' inner mind, which depends on the function and the value of online games. Thus, this research suggests that the experience of playing, psychological needs and the value self-fulfillment are the key factors could affect attention span in online games.

By discussing an article reviewing of related attention span, Guan, & Lin (2003) pointed out that the core constructions of online games are divided into "entertainment": the content of the game and a sense of achievement to the players' "interaction", such as establishing relationships between the online player and the "Game Master", and lastly, the content variety of online games design is a crucial factor, which is highly related to players' attention span. This research is based on the above mentioned perspectives: exploring the relationships between the players' attention span and consumption by examining the creating value of emotion. "Attention span" is set as the key construct in our research model.

3. Research Model

3.1 Model & sample

Based on one's research proposal to construct the

research framework, we will be exploring and organizing the relevant articles so as to setup hypotheses, online questionnaires used, and the collection of users on the thought of creating value of emotion. Furthermore, we will be looking at the flow experience, adhesion degree and the points of view from the consumer to also be the issues that paper will discuss later on. The research model is shown in figure 3 and the related research methods as follows:
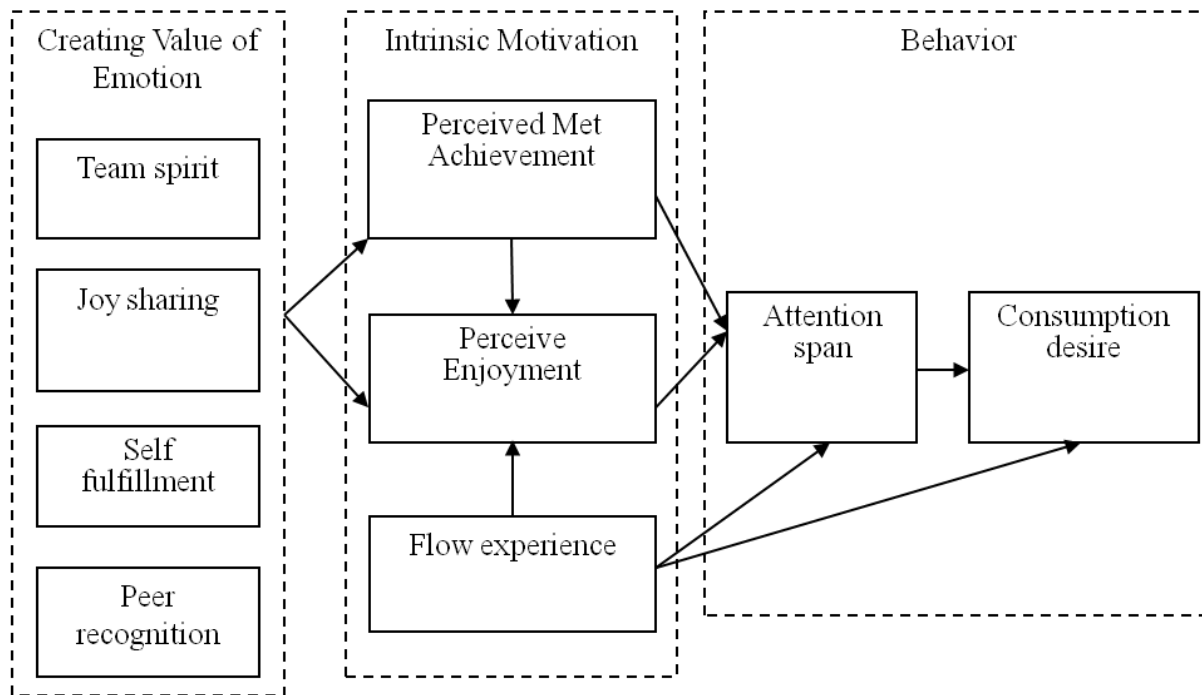

Figure 3. Results of relationship analysis The Research Model

By taking the questionnaires we used it to verify the hypothesis, validate the results to construct it into empirical value. The design of this research questionnaires process was divided into two stages. In the first stage, we personally participated in numerous online games for about six months for observation and to revise the questionnaires. In the meantime, we take the interviews of the other online gamers in order to confirm the questionnaire's content repeat, by which to make a pre-test of the players for the research. In the second stage, we chose a sample population. The sample population we chose the users who went to the website "Bahamut" (http://www.gamer.com.tw/) and "Gamebase" (http://www.gamebase.com.tw/) , the questionnaire were set online for players to take this test. It is known that online questionnaires reduce the errors that can happen in paper based questionnaire. The purpose of the research

is aimed to explore the "creating value of emotion" and "attention span of players", this survey will help significantly as a method for our research.

The steps of research are constructed as follows:

1. Creating the research hypotheses, research propositions, variables operation, and the design of the questionnaire is the first step. We have listed nine constructs by the already mentioned study model as following: (1)creating value of emotion factors – "Team spirit", (2) creating value of emotion factors – "Joy sharing", (3) creating value of emotion factors – "Self-fulfillment", (4) creating value of emotion factors – "Peer recognition", (5) "Perceived Met Achievement", (6)"Perceived Enjoyment", (7) "Flow experience", (8) "Attention span", (9) "Consumption desire".

2. Based on these nine constructs, we define its operation so as to set the hypothesis.

3. Survey the questionnaire and make statistical analysis.

4. By using statistical model software (SPSS) with the questionnaires survey, the process of its analysis includes the basic data analysis (descriptive statistics), the quantitative validation with the reliability and validity analysis, related coefficient analysis, linear regressive analysis, and overall construction analysis.

5. Results and Conclusion: the conclusion will then be revealed along with the explanation index of coefficient that results from research model.

3.2 Research design

Based on our research model to construct the hypothesis, variables operation, and questionnaire design, the research uses this method to validate the hypothesis. By taking its empirical validated research as a population, this research design is categorized as follows:

There are nine constructs in the research model for the questionnaire:

1. Creating value of emotion factor－Team spirit
2. Creating value of emotion factor－Joy sharing
3. Creating value of emotion factor－Self-fulfillment
4. Creating value of emotion factor－Peer recognition
5. Perceived met achievement
6. Perceived enjoyment
7. Flow experience
8. Attention span
9. Consumption desire

Based on these nine constructs, we have created a total of ten hypotheses as follows:

H1:"Creating value of emotion" is positively related to "Perceived met achievement" toward playing online game "World of Warcraft".

H2:"Creating value of emotion" is positively related to "Perceived enjoyment" toward playing online game "World of Warcraft".

H3:"Creating value of emotion" is positively related to "Flow experience" of toward playing online game "World of Warcraft".

H4:"Perceived met achievement" is positively related to "Perceived enjoyment".

H5:"Flow experience" is positively related to "Perceived enjoyment".

H6:"Perceived met achievement" is positively related to "Attention span".

H7:"Perceived enjoyment" is positively related to "Attention span".

H8:"Flow experience" is positively related to "Attention span".

H9:"Flow experience" is positively related to "Consumption desire".

H10:"Attention span" is positively related to "Consumption desire".

The questionnaire is divided into two parts: basic information and nine constructs, we will then use the "Likert scale measures" to examine.

1. Questionnaire test: by taking the valid questionnaire to make SPSS statistic tool in analysis and testing, in terms of the date analysis, (frequency distribution and description statistic), quantitative analysis (reliability and validity), related analysis, regressive analysis and overall constructs analysis.

2. Result and conclusion: the conclusion resulted through the coefficients of the research model.

3.3 Pre-test analysis

The period of the pretest process is from 2010 January 21 to May 15, by which to result totally 243 questionnaires. Invalid entries were deleted using the criteria as follows:

1. All selected answers are the same options or

by the same order;

2. The selected answers contradict;

3. Filling incomplete information, or vacant entries;

4. The game that users played did not match with the research subjects.

The results of our online questionnaire were compiled through our computer's confirmation to avoid errors. The pretest resulted in 192 valid questionnaires, in which the effective response rate up to 79% and the proportion of male players (75%) much more than the women players (25%). The ratio between male and female is thus about 3:1. There is not much difference on this survey reveals as most of the viewpoint the majority of male gamers (Lin, Tzu-Kai 2002; Xusheng Ling, 2004). In the aspect of their age in its pretest, there were 66 people between 20 and 24 years old in this age group (accounting for 34.37%), 67 people between 25 and 29 years old (accounting for 34.9%), and 9 people between 15 and 19 years old (accounting for 4.6%). The conclusion was that the players' ages between 15 and 29 occupied a high proportion up to 73.6%. We have also found out that students (accounting for 60%) are the main customers among them, the result of which is in line with our former research.

Most players enjoy online games through ADSL, or Cable modem broadband (93.1%), as similar as the result of the survey articles. Due to the popularity of broadband Internet, this proportion is used more than ever. When we asked for their total playing time, most of the players (the interviewees) that were involved in this research who have been playing for at least two years (85.3%); 10 hours in a week (29.3%), 10 to 20 hours in a week (23.1%), 20 to 30 hours in a week (15.8%), even more than 50 hours in a week (14.9%), in which would be a reference for our research.

From the questionnaires, we also found out that there are several games were regarded as the most popular by players, the ratio of which as up to 68.78%, some of these games were not listed in the questionnaires. It is thus evident that online games can be easily eliminated. For that reason, many early games have disappeared in the business market. Whereas, the game Ragnarok Online, Paradise Online and other industry games are the main productions which has gathered a lot of popularity. This year, most players prefer the "World of Warcraft", with their market share up to 20.8%, users also like playing the 2D adventure games, such as "Maple Valley", their market share of which is up to 10.9%.

For making a reliable questionnaire, we took the above research variables to make Cronbach's α coefficient calculation, the result of which is illustrated as table 1: Each Cronbach's α coefficients resulted with the value from 0.66 to 0.94. According to DeVellis (1991), Nunnaly (1978) and other scholars viewpoints, a reliable score will be concluded when Cronbach's α value was resulted between or equal to 0.70 to 0.98. By the same context, Wortzel (1979) considers that the score cannot be convinced when the value of Cronbach's α less than 0.35. As a whole, this research questionnaire thus brings a reliable conclusion by means of this variables, 0.9401 is what the research table resulted, to which the research results came out with an acceptable range and consistency.

Table 1. Reliability analysis of the pre-test measured:

Dimension	Cronbach α N = 192	Reliability range
Team spirit	**0.9293**	**High reliability**
Joy sharing	**0.9107**	**High reliability**
Peer recognition	**0.6569**	**Moderate reliability**

Self-fulfillment	0.8906		**High reliability**
Perceived met achievement	0.8625		**High reliability**
Perceived enjoyment	0.8628		**High reliability**
Flow experience	0.9167		**High reliability**
Attention span	0.9253		**High reliability**
Consumption desire	0.8935		**High reliability**
Overall scale	0.9401		**High reliability**

We took the Pearson analysis to examine two variables in the hypothesis that we proposed by using the research model to proceed and analyze its two stages of the test. In the first stage, there was an analysis of the variables coefficients in the four constructs of creating value of emotion, then, according its results, the coefficient of the recessive creating value of emotion thus can be identified as table 2:

Table 2. Pearson product-moment correlation coefficient matrix

	Team spirit	Joy sharing	Self-fulfillment	Peer recognition
Team spirit	1			
Joy sharing	**0.503***	1		
Self-fulfillment	**-0.83**	**-1.31**	1	
Peer recognition	**0.296***	**0.379***	**-0.65**	1
*P＜0.05 **P<0.01 ***P<0.001				

It is thus clear that "Team spirit" and "Joy sharing", "Peer recognition" are significantly related to each other. Nonetheless, "Self-fulfillment" that is not significant. We thus concluded that team spirit would create joy; the sense of its perceived achievement thus could share with other players as well. At the same time, the variables coefficient concludes that peer recognition would be significantly related to the factors of creating value of emotion, whereas, the aspect of self-fulfillment does not have a significant effect.

In the second stage, by taking the factors of the above four variables to average the Factor loading of its creating value of emotion so as to explore analyze the aspects of "Perceived met achievement", "Perceived enjoyment", "Flow experience", "Attention span" and "Consumption desire" by its variables, the result is illustrated in table 3.

Table 3. Pearson product-moment correlation coefficient matrix in Pre-test

	Creating value of emotion	Perceived met achievement	Perceived enjoyment	Flow experience	Attention span	Consumption desire
Creating value of emotion	1					
Perceived met achievement	**0.507***	1				
Perceived enjoyment	**0.436***	**0.687***	1			
Flow experience	**0.520***	**0.506***	**0.571***	1		
Attention span	**0.448***	**0.518***	**0.656***	**0.601***	1	
Consumption desire	**0.478***	**0.513***	**0.590***	**0.610***	**0.708***	1
*P＜0.05 **P<0.01 ***P<0.001						

According to table 3, the "Creating value of emotion" has a significantly relation with "Perceived met achievement" by its variables in 0.597, the result of which bring a conclusion that the related emotional value of "Self-fulfillment", "Team spirit", and "Peer recognition" for the recessive creation value, it has a significant positive correlation with "Perceived met achievement". When the significance level of recessive creation value is under 0.001 ($p<0.001$), "Perceived enjoyment" , "Flow experiences", "Attention span", and "Consumption desire" then have significant positive correlation, to which it is thus evident that players' emotional values would be created by "Joy sharing", "Peer recognition", "Team spirit", and the "Self-fulfillment". Maslow's hierarchy of needs "self-actualization", "love / belonging" and "friendship/intimacy", are emotional values of which would be positive effect creating a sense of enjoyment and a state of immersion when playing games. That is to say, the creating value of emotion would increase players' attention span and consumption desire. What is more, "Perceived met achievement" has a significant and positive relative with "Flow experiences", "Attention span" and "Consumption desire", that is, when players gain the sense of achievement, then, its helps them to increase their inner experiences and influence their behaviors as one of the above-mentioned, we can understand when players are immersed in the game when a challenge appears in the level. In its challenges, the players encounter a sense of time distortion, and exploratory behavior. Their curiosity would cause them to pay their full for attention in to a mental state of temporary concentration for their inner cognitive joy and playfulness, to which it is an effective way to enhance the attention span and consumption desire. These empirical results are in line with the idea of Hoffman & Novak (1996), and Moon & Kim (2001). They both stated that "Perceived enjoyment" would provide a

significant impact on "Consumption desire". Moreover, Lo's (2004) thesis also claimed that when players lose their flow experience, they lose their sense of satisfaction in the meantime. Thus, our hypothesis echoes the statement of the pervious experts. Moreover, the related statistics of the "Attention span" and "Consumption desire" is up to 0.708, in which also brings a significant effect that is in line with the articles we survey and the observation of players' behaviors. Thus, this paper concludes that the creating value of emotion would increase player's "Attention span" and "Consumption desire" for the result of this pre-testing.

4. Post-testing

The post-testing proceeded on July, 2010 for the research also takes form of an online questionnaire, the questionnaires were set on the "Gamebase" website to collect the response of players, and 1992 valid questionnaires were thus obtained. The research showed that 337 responses chose "World of Warcraft" as their favorite. Total were 293 valid questionnaires excluding incomplete responses, which made the valid rate to 86.94%. The statistic examination of this stage includes the examination of its substantial relationship of descriptive statistic and regressive analysis in order to compare the overall constructs analysis and its explanatory ability.

4.1 Descriptive statistics

The average score of all the variables can be created through the post-test descriptive statistics of the variables, which result of variable constructions that are higher than 3, in which the "sense of belonging" as 4.2688 is the highest, indicating that the sense of belonging is the most important among other constructions by most of the players' online gaming – "World of Warcraft", and other constructions as "Perceived met achievement" (3.6664), "Perceived enjoyment" (3.9019), "Flow experience"(3.5307), "Attention span"(3.0785),

"Consumption desire" (3.7978). It have presented that the majority of online gamers consider that online games such as "World of Warcraft" with "Recessive value create" are able to affect positively "Perceived met achievement" ,"Perceived enjoyment" , and "Flow experience", and is thus, the player then have its "Attention span" and "Consumption desire". That is to say, most of the players had a positive perception of the game.

4.2 Validation of the hypotheses

The research takes the analytical relationship by 3.3 with pre-testing. During the process of its post-test, the research based the online 293 valid questionnaires that were obtained during July, 2010, with a correlation matrix between the component of the construction of the creating value of emotion and behavioral constructs were illustrated as table 4. Then, the variables related to hypothesis model created as figure 4. It thus concludes that there are obvious correlations between each variable, with the hypothesis research proposed.

Table 4. Pearson product-moment correlation coefficient matrix in Post-test

	Creating value of emotion	Perceived met achievement	Perceived enjoyment	Flow experience	Attention span	Consumption desire
Creating value of emotion	1					
Perceived met achievement	0.525***	1				
Perceived enjoyment	0.434***	0.485***	1			
Flow experience	0.507***	0.687***	0.504***	1		
Attention span	0.454***	0.558***	0.464***	0.631***	1	
Consumption desire	0.738***	0.476***	0.417***	0.546***	0.442***	1
*P < 0.05 **P<0.01 ***P<0.001						

H1: The relationship of "Creating value of emotion" with "Perceived met achievement" was positive, as shown by the path coefficient of 0.525 (p<0.001) in figure 43. The result supporting H1.

H2: The relationship of "Creating value of emotion" with "Perceived enjoyment" was positive, as shown by the path coefficient of 0.434 (p<0.001) in figure 4. The result supporting H2.

H3: The relationship of "Creating value of emotion" with "Flow experience" was positive, as shown by the path coefficient of 0.507 (p<0.001) in figure 4. The result supporting H3.

H4: The relationship of "Perceived meet achievement" with "Perceived enjoyment" was positive, as shown by the path coefficient of 0.454 (p<0.001) in figure 3. The result supporting H4.

H5: The relationship of "Flow experience" with "Perceived enjoyment" was positive, as shown by the path coefficient of 0.687 (p<0.001) in figure 4. The result supporting H5.

H6: The relationship of "Perceived met achievement" with "Attention span" was positive, as shown by the path coefficient of 0.558 (p<0.001) in figure 4. The result supporting H6.

H7: The relationship of "Perceived enjoyment" with "Attention span" was positive, as

shown by the path coefficient of 0.464 (p<0.001) in figure 4. The result supporting H7.

H8: The relationship of "Flow experience" with "Attention span" was positive, as shown by the path coefficient of 0.631 (p<0.001) in figure 4. The result supporting H8.

H9: The relationship of "Flow experience" with "Consumption desire" was positive, as

shown by the path coefficient of 0.546 (p<0.001) in figure 4. The result supporting H9.

H10: The relationship of "Attention span" with "Consumption desire" was positive, as shown by the path coefficient of 0.442 (p<0.001) in figure 4. The result supporting H10.

The above examined hypothesized relationships among various constructs were shown in figure 4.
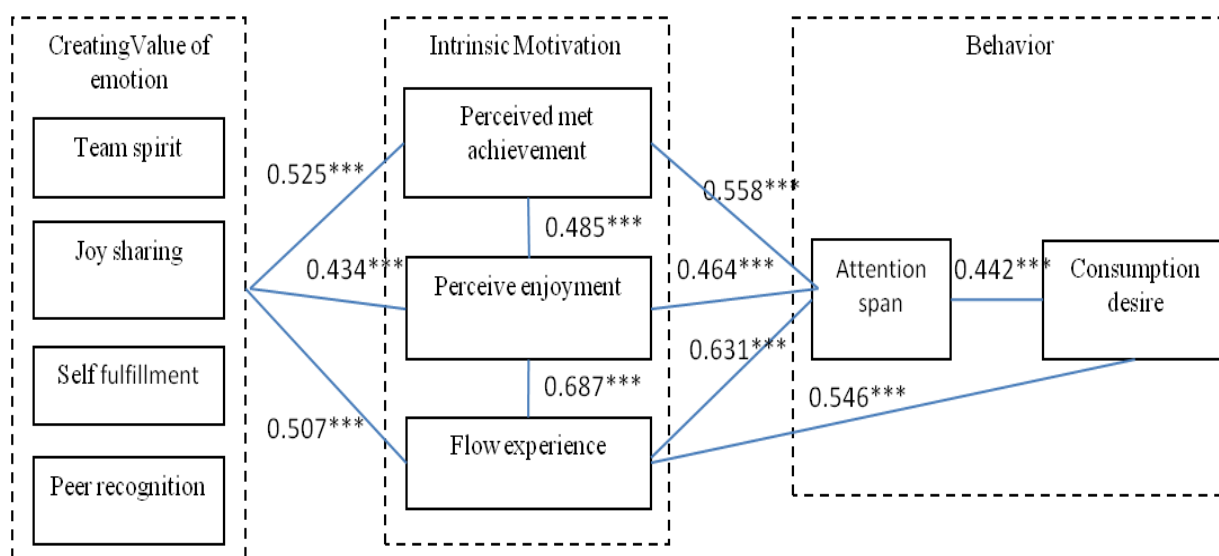
Figure 4. Results of relationship analysis

4.3 Regression analysis

The research takes a regressive analysis method to examine the influence of "Creating value of emotion" on the "Attention span", "Flow experience", and "Consumption desire" on players. The regressive R^2 value would reflect the explanatory ability of independent variables and the dependent variable, the value would help to further understand the level of variables that correlate so as to analyze its direct and indirect relationship between each variable.

Regressive analysis examines the influence of value creation on players' attention span.

(1) Function: Attention span $=f\{$ Creating value of emotion$\}$

The analyzed result of R^2 value between independent variable and the dependent variable

represent R^2 value as 29.5% which indicates that "Creating value of emotion" would explain "Attention span" as 29.5%, and F-value as 123.395（$p<0.001$）, the regressive analysis has a statistic explanatory effect.

Regressive analysis examines the influence of "Creating value of emotion" on players' "Flow experience".

(2) Function: Flow experience $=f\{$ Creating value of emotion$\}$

The analyzed result of R^2 value between independent variable and the dependent variable represent R^2 value as 17.1% which indicates that "Creating value of emotion" would explain "Flow experience" as 17.1%, and F-value as 61.125（$p<0.001$）, the regressive analysis has

statistic explanatory effect.

(3) Function: Consumption desire $=$ f {Creating value of emotion}

The analyzed result of R^2 value between independent variable and the dependent variable represent R-square value as 19.3% which indicates that "Creating value of emotion" would explain "Consumption desire" as 19.3%, and F-value as 70.640 （$p<0.001$）, the regressive analysis has statistic explanatory effect.

The above regressive analysis indicates that the influence of "Creating value of emotion" on players' "Attention span", "Flow experience", "Consumption desire" as 29.5%、17.1%、19.3%, which were also influenced by other constructs of the research model. The research concluded that there are effects of "Creating value of emotion" which exists on above constructs.

If research is aimed to the explanatory ability of "Attention span", "Creating value of emotion", "Perceived met achievement", "Perceived enjoyment", and "Flow experience" are the influence variables. We took a regressive analysis to examine the effect of the multi-constructs as follows:

(4) Function: Attention span $=$ f {Creating value of emotion, Perceived enjoyment, Perceived met achievement, Flow experience }

The variations make effect on "Attention span" in "World of Warcraft" including "Creating value of emotion" （$\beta=0.247$, $p<0.001$）, "Perceived meet achievement" （$\beta = -0.006$, below the significant）, "Perceived playfulness" （$\beta=0.493$, $p<0.001$）, and "Flow experience" （$\beta=0.164$ $p<0.001$）. With the exception for "Perceived met achievement" being below the significant, all variables of which bring a positive effect on the "Attention span" of online game－"World of

Warcraft", which goes. up to 54.7%.

(5) Function: Consumption desire $=$ f {Creating value of emotion, Perceived enjoyment, Perceived met achievement, Flow experience }

The variations effect on "Consumption desire" in "World of Warcraft" including "Creating value of emotion" （$\beta=0.028$, $p<0.001$）, "Perceived meet achievement" （$\beta = -0.091$, $p < 0.001$）, "Perceived playfulness" （$\beta=0.163$, $p<0.001$）, "Flow experience" （$\beta=0.139$, $p<0.001$）, and "Attention span" （$\beta = 0.388$, $p < 0.001$). All variations of which thus bring a positive effect on the "Consumption desire". The resulted as 44.4% of the variance in "Consumption desire".

(6) Function: Perceived playfulness $=$ f {Creating value of emotion, Perceived meet achievement, Flow experience }

The variations effect on "Perceived enjoyment" in "World of Warcraft" including "Creating value of emotion" （$\beta=0.130$, $p<0.001$）、 "Perceived meet achievement" （$\beta=-0.298$, $p<0.001$）、 and "flow experience" （$\beta=0.301$, $p<0.001$）, all variations thus bring a positive effect on the "Perceived enjoyment" of this game, which resulted in 35.8% of the variance in "Perceived playfulness".

4.4 Overall analysis of construct

The research takes path analysis to validate the overall constructions, by which regressive analysis could combine the different functions in order to explore the relationship of variations. Whether is direct or indirect, we shall examine its cause and effect, through its research construction. The results are illustrated as figure 5:
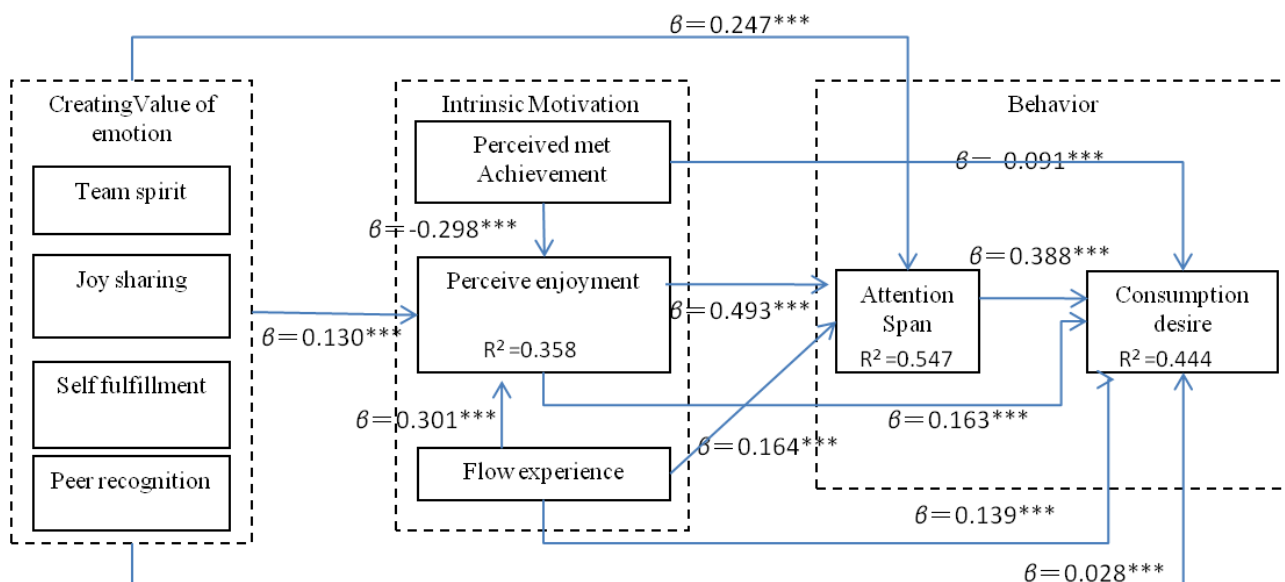
Figure 5. Results of overall constructs analysis

Through the result of the post-test analysis, this research has validated that "Creating value of emotion", "Perceived enjoyment", and "Flow experience" make a direct and indirect effect on "Attention span" and "Consumption desire". This hypothesis has been supported and validated as follows:

(1) Perceived met achievement: World of Warcraft player's "Creating value of emotion" had a highly significant influence on "Perceived met achievement", that is to say, the "Creating value of emotion" helped players increase the sense of achievement so as to get satisfaction when playing the game. When players lack a of sense of achievement in the real world, they turn to the virtual world and gained their needs in the game. This result is in line with TAM and eTAM constructs of the external factors that "Perceived met achievement" has positive effect on its "Perceived enjoyment".

(2) Perceived enjoyment: in the game "World of Warcraft" had "Perceived met achievement", "Creating value of emotion" and "Flow

experience" causing significant influence on "Perceived enjoyment". "Perceived met achievement" brought the largest effect, "Flow experience" being the second largest, and lastly was "Creating value of emotion". This had a direct and indirect positive correlation for the players' "Perceived met achievement", resulting in line with TAM and eTAM constructions of external factors of the "Creating value of emotion" which its positive behavior constructs with "Perceived met achievement", "Perceived enjoyment", and "Flow experience". "Perceived enjoyment" and "Flow experience" made a significant influence on "Perceived met achievement".

(3) Flow experience: The results show that the users in "World of Warcraft" had "Creating value of emotion" as an influence on "Flow experience" in which "Creating value of emotion" brought positive effects on "Flow experience". This result is also in line with Lo's (2004) study which indicated online games will produce a significant positive effect on "Flow experience" when playing with other players in the game in context of these various factors. The

online game will lead the player to become immersed in the game during the session which it was played for a variety of experiences, this result has also been verified which and also met in our research.

(4) Attention span: with the exception of the "Perceived met achievement", World of Warcraft players had "Creating value of emotion", "Perceived playfulness" and "Flow experience" as significant influences on their "Attention span", especially for "Creating value of emotion" which the most important issue to explore for our research. In Lo's (2004) study, it discussed the "Creating value of emotion" which dwelled the concepts such as "value of designed for the game, the quality of the connection, the issuing company's reputation, and convenience of access". This is not part of the player inner feelings but game company's technical aspect. Thus online gamers' "Attention span" has its correlation to "Creating value of emotion".

(5) Consumption desire: the results show that "World of Warcraft" players' "Consumption desire" has a significant and indirect effect by the "Creating value of emotion", "Perceived meet achievement", "Perceived playfulness", "Flow experience", as well as "Attention span". Although the study results shown that "Consumption desire" had not brought a very high significant effect on "Creating value of emotion", it indirectly made on influence on other constructions, resulting in a positive influence on "Consumption desire".

5. Conclusion

This research is aimed to the statistic result of quantitative methods in order to make a realistic representation of the population of online gamers. We set

the questionnaires onto the main online game website, Bahamut and Gamebase to collect information on the members of website as the sample population, then, 293 valid questionnaires were thus be obtained in the post-test, and the effective response rate was up to 86.94 %, which reliability analysis concluded that all of variables Cronbach's α coefficients ranged from 0.65 to 0.94. Moreover, the questionnaire strengthened the hypothesis for this research. What is more, its relationship analyzed result showed that each construct had a significant correlation with each other. Taking our research model to go further explore on players' "Creating value of emotion", "Perceived met achievement", "Perceived enjoyment", "Flow experience" and "Attention span" to conclude it made a significant and positive impact on "Consumption desire". Finally, the research made a regressive analysis with the overall constructs analysis. This research is one of the first domestic empirical literatures to explore the creating value of emotion in the aspects of plays' attention span, cognitive factors, and "Flow experience" link with the outer behavior "consumption desire". To sum up, by the result of our quantitative statistic analysis, our hypothesis has been confirmed; when the player's cognitive needs are strengthened, the creating value of emotion and their attention span would increase.

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International Journal of Digital Media Design ／Volume 4／Number 1／December 2012

ISSN 2078-4775