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The Development of Interactive Navigation Interface for Virtual Museums

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ABSTRACT

Most virtual museums present in a way of static website. Lacking the interaction with real environment, users only receives restricted demonstration information. This study adopts an interactive navigation design and the virtualreality to express the virtual museum environment. By developing new virtual reality techniques, users may experience a simulated space. In proposed virtual museum, users can choose different viewpoints, choose different tour routes, and interact with the exhibitions in the museum. Thus, the users can visit museum by only browsing multimedia information contents.

Keywords: Avatar, Interaction Design, Navigation, Virtual Museum

1. Preface

At present, most of the virtual art museums are planned in structure of webpage, and browsed topics are connected by hyperlink, however the present of static image lacks interactive feedback and living feeling of art museum; on the other hand, some virtual art museums present space by imaged-based virtual reality to show an annular image, whereas the limited interactive mode lacks intuitive feeling and interactive process. The study built a virtual art museum integrated with personalized participation and interactive feedback to create a presented space with more imagination and immersion with Virtual Reality Development Software. It can give users the feeling of staying in another virtual art museum that presents image from different point of views, supply deeper reality feeling, break the space limitation to browse reality museum and show a present space with multiple interaction.

2. Literature Review

Discussion of literatures is divided into three parts, the first part is description of development and application of virtual reality; the second part is research of virtual art museum digitalization that is the presentation allows interactive browse between artworks and visitors with art display in digital way; and the last part is to discuss design and research of interactive tour guide and to provide appropriate tour guide system to allow users involved in.

2.1 Development and Applications of Virtual Reality

Virtual reality is to utilize three dimensional virtual space produced by computer emulation, together with simulations of vision, hearing even touching to create a virtual environment that gives you the feeling on the scene. (Yeh, 2003) The simulated environment can supply users the feeling of immersing plot of scientific fiction novel when in the virtual space and interaction with peripheral equipment or device. So virtual reality can let users involve in the virtual space with real feeling and high interaction. The common applied fields for virtual reality are as following: (1) Entertainment Industry: interactive film, virtual interactive game. (2) Education & Training: flight simulation, sport simulation. (3) Medical area: virtual surgery, long-distance remote surgery. (4) Vision art: virtual art museum, dynamic art, virtual stage design. (5) Business application: online product presentation. (6) Landscape simulation: city planning.

2.2 Research of Virtual Art Museum Digitalization

Virtual art museum is to use virtual reality technology to present collection and atmosphere of art museum through scientific and technical display with virtual reality technology simulated reality space and show a virtual exhibition of an emulated reality space. It contains online tour guide inside museum, arts online present and so on. Real museum should be characterized with collection, present of material object and location with function of education and research, whereas the virtual art

museum shows function of collection, present, education and research in digitalization way (Lin, 1999). And it simulates the present space inside museum by use of 3D virtual reality technology. Characteristics of virtual art museum concluded by the study are:

(1) Continuous information and personal present virtual space can be provided without limitation of time and space for character of internet. Character of personal browse and interaction of virtual art museum promote present function of art museum.

(2) Higher order interface design and interaction can be supplied by virtual museum established by virtual reality technology.

(3) Through digital process, virtual art museum uses multimedia and virtual reality to present creative experience and interaction and intends to allow visitors to become the active participants, not passive visitors.

(4) The real art museum can only exhibit part of collections and supply limited information for restriction of exhibition environment. However, the virtualized art museum can present more deep knowledge for visitors by applying information technology and planning design.

Ullrich and Zara (2002) provided four exhibition orientations for current virtual art museum:

(1) Webpage structure of static 2D space:
It uses HTML(Hyper Text Markup Language) as syntax structure to input data in picture of video file with volume label <IMG> and presents information inside art museum with static media. The webpage structure allows users to click the desired topics by hyperlink, but the static images are short of attraction to vision, interaction, interactive feedback and feeling on the scene of art museum.

(2) Image-Based virtual reality
Technology of QuickTime VR (Virtual Reality) can presents panoramic image of reality environment with pictures of real scene and supply technology of cross-platform virtual reality to let visitors have the feeling of being personally on the scene.

(3) Virtual present in three-dimension space
This kind of art museum mainly is structured by VRML 3D Image Label Language that can expand platform of applied network to three-dimension graphic space. Browse way can be chosen by control toolbar of VRML 3D Tour Guide in Soviet History Museum..
Under VRML circumstances, Walk-through Browse Mode can supply operation involving walking, translating and rotating etc., so that users can come and go freely in the virtual space. In the visual emulation of VRML, model with smaller scale is presented by limited accuracy emulation.

(4) Present with virtual reality development software
Virtual Reality Development Software carries out design in module way with objective orientation, and mainly includes Virtools and Quest3D, which can supply interface of instinctive graphics. Scene with 3D can supply more accurate object model and virtual space, and interactive control of visit direction for users.
Users can have various visit experiences by technology of virtual reality and control of entering device. Different developed technology of virtual reality can endue present with different characters.

2.3 Design and research of interactive tour guide

In the way of interactive tour guide, virtual art museum can let visitors know about exhibits and broad relevant knowledge, guide them to know how to communicate with the arts, and supply explanations of visit experience and exhibits. For users, interaction refers to a proper guide system that can let users involved in, to design the system from the point view of users can meet demands of users and let users be the participant of instant interaction and immerse the virtual simulative circumstances. Space of virtual art museum can provide not only reality of scene, but also simulation and natural immersion for users. Characteristics of virtual environment principally include virtual avatar role for users in the virtual environment, interactive control in space of virtual environment, virtual space with simulation sensed by vision or hearing etc. (Tolga, 2000).

To let users immerse in the environment, design concept centered on users supplies active role with assistant information to give proper information for meeting users' demands. Situation that users face in the virtual space can be simulated, and virtual avatar can simulate human and produce relevant form and function when actions of users are setting in the virtual avatar (Zeitzer & Johnson, 1994). Through display of virtual avatar for users, personal avatar and movement of self view point in the virtual environment, we can know clearly

(Tolga, 2000):
(1) How to control avatar in virtual environment.
(2) Relationship between action of virtual avatar and control by users in reality world.

Virtual avatar is the key technology of interactive design. It can provide virtual display person, virtual tour guide, and virtual player. It can also simulate all kinds of movement of human in any possible condition. In the virtual world, it can play agent of computer and avatar of real visitor at the same time (Granieri, Becket, Reich, Crabtree & Badler, 1995).

3. Study Structure and Design

The chapter of study structure and design will describe design planning and development process of this experimental system, the experiment design attempts to establish an exhibitive space of virtual art museum to display function of tour guide in interactive process between users and art museum. Then making process of experimental system will be related to next and design mode process is the key part stated, the last part is the assessment of experimental method to system design. Planning of design procedure for interactive tour guide in virtual art museum of the study can be divided into three phases: the first one is the primary planning from that study concerned to virtual art display is discussed and design concept is formed. The second phase is medium-term making part that structures the model scene and executes action design for module. And the third phase is the final test that tests and adjusts system content with integrated model scene and interactive action design and analyzes and concludes application and progress development of virtual art museum.

4. Planning of Experimental System Design

In the primary design of experiment, we can know meaning and orientation of art museum to visitors by integrating data of scene and test model, and can plan and improve display style of current virtual art museum. We carried out the experiment design from three aspects: scene planning, virtual avatar and tour guide interface, from the primary design, we can test the originate simulation system and improve the later completed design after assessment and review of the test result.

4.1 Design Mode

In the actual process of design virtual art museum, planning of virtual art museum scene on the planning idea of modern art museum and concept of simplicity and beauty were made mainly with 3D drawing software at first. And the placement, material and emulation light of exhibits were made. Then the completed scene design was outputted to virtual reality software Quest3D for interactive planning.

Structure scene	Block of object material
Input object of scene	Set object collision
Set virtual environment	Set camera and avatar
Interface design	Design of interface control
Design interactive	Interactive mechanism of users
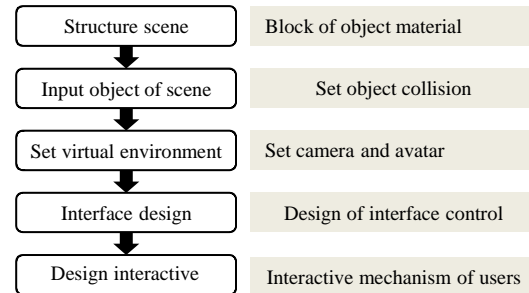
Figure 1. Design Mode Process

5. Analysis of Experimental System

Design concept of virtual art museum mainly is to conduct knowledge of arts to users and guide visitors to immerse the virtual environmental naturally by simulative scene of virtual reality, role of virtual avatar and feedback of interactive interface mechanism. A virtual art museum should be established from the standpoint of users, an appropriate space concept should be designed, and information should be displayed in the interface mode of interactive tour guide.

(1) Scene planning
    Scene planning should supply knowledge of exhibits and sensory experience, as for subject feeling of users, the natural virtual environment should give familiar immersion feeling for users when users enter virtual art museum. So space planning of art museum should orientate modern art museum and arrange exhibition area with simple line.

(2) Set virtual avatar
    Users can own their own substitutes by role of virtual avatar in the virtual environment. If form of virtual avatar is more natural, the feeling on the scene is stronger (Juan & Edwin, 2000). So the avatar is set as a personate female figure. Virtual avatar of the study is chosen from the roles set by Quest3D, which provides model with more simplified scale that can be effectively helpful to the fluency of picture of virtual reality in instant calculation.

(3) Interactive interface design
    Present of interactive image interface can guide users to know arts in browsing virtual art museum, its instinctive image design can performance function concise.

Function of interactive interface falls into four items: switch shot, zoom exhibits, play multimedia, description of exhibits.

5.1 System setting

Structure is designed to allow users to browse space inside the museum and have options to switch shot and viewpoints freely by virtual avatar when users enter the scene. The main three interactive tour guide types in the study are: Exhibition Content Type, Dynamic Multimedia Type and Interactive Control of Exhibits. Users can control to browse exhibits and obtain descriptive information by interactive interface (Figure 2).
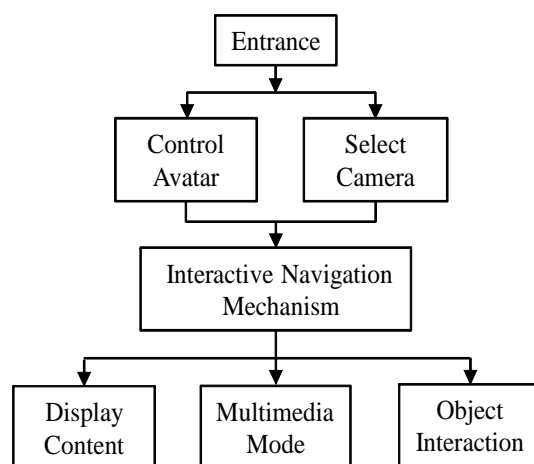
Figure 2. Designed Structure

6. Experimental Environment

The experimental object is mainly to assess control of interactive tour guide and usage of interface when users browse the virtual art museum. Experimental aim for control of interactive tour guide is to know whether interface system has necessary functions and can provide appropriate interaction for users to operate and understand easily. And aim for assessment of interface usage is to see whether system can provide appropriate feedback that matches with expected function of users and be the familiar and quick-to-learn system.

6.1 Experiment assessment

Experts took part in assessment of user's interface and provided questions and suggestions to system to see whether system had the necessary usage of interface and function of tour guide. Based on the suggestions and assessment of experts, more effective system for test and usage of the system would be put forward. And common users with different backgrounds and experience would join in the latter-term test and provide feedback on operation process of

system for improvement of system.

6.2 Experimental result

The study constituted scene object model, block of material and light with 3D Studio MAX 7, and the interactive process module of interactive tour guide was designed by Quest 3D 3.6.3 (virtual reality development software that develops design with module way of object orientation)

(1) When entering the virtual art museum

Executive experimental system starts, a virtual avatar role can be seen, which stands for the substitute of user in the virtual art museum and supplies interaction with virtual space for user, and the virtual avatar can walk and browse and system will provide concerned information according to present location of avatar (Figure 3).

Figure 3. Operation environment of experimental system

6.3 Environment Interactions

(1) Exhibition Content Type

It can describe exhibition and guide users to know arts. System will provide users prompt description of exhibition by clicking image interface (Figure 4), and the description content includes author, title, time and mark of using media, users can click further related introduction of artists and choose interested content according to different involving extents.

Figure 4. Exhibition Content Description Type

(2) Dynamic Multimedia Type

In the part of dynamic multimedia play, system can detect user's location and

trigger interface control when user enters inductive area of video play, and user can choose watch or browse dynamic video freely by the interactive feedback control. Not like the reality exhibition, the character will not be restricted by time or place and can display with multimedia that can add browse joy for visitor and narrow distance between exhibit and visitor.

Figure 5. Exhibition Content Description Type

Figure 6. Exhibition Content Description Type

(3) Interaction control of exhibits
Visitors can appreciate exhibit in 360 degree or zoom exhibits freely by control of interactive interface. When users accesses solid artwork, system will detect the location and trigger interface control to let users click the rotation button that can display solid artwork in rotation, the present data displayed by virtual interaction is more lively, familiar and multiple, and the personal way to study exhibits can deepen knowledge and interests of visitor to exhibits.
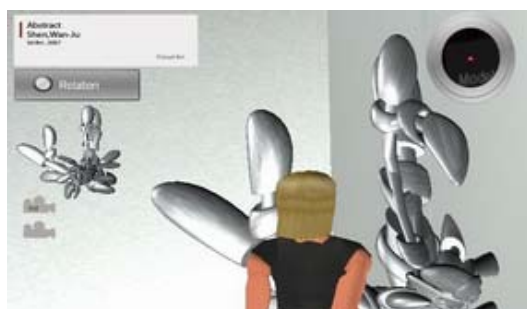
Figure 7. Exhibits Description Type

7. Conclusions

(1) Using virtual reality software Quest3D as the development tool to structure virtual art museum can present art museum in the 3D space and display artworks more subtly. Users can have interaction with artworks in the virtual space. And users can browse and walk in the art museum freely through role of virtual avatar by interface of virtual reality and more rich dynamic displays can be conducted to users by interaction.

(2) Multimedia content is used to provide display way of text, multimedia and sound in the exhibition of tour guide, and the dynamic display can interest visitors and make an appeal to them to deepen their impression to the work and understand to the topic; the virtual art museum of the study equips with multiple interactive modes including switch shot and viewpoint, interactive control of exhibits, dynamic multimedia tour guide and plane map mode.

(3) Plane map mode of image interface design can give visitors direction guide in present space in browse. And user can choose different tour guides or view distances in the interaction with artworks. The study was designed on principle of usage and the completion of system has been promoted by assessment and improvement of experts.

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Research on Digital Games Design and Development towards Taiwan's Folk Customs and Skills—The Neimen Song Jiang Battle Array Example

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Abstract

With the Song Jiang Battle Array, the research of one folk custom of Neimen Village, in Kaohsiung County as the background of the game, combines the information technology and creative design to develop a game featuring interactive teaching, digital repository, and cultural promotion, which enables the players to acquire knowledge about the folk customs of the Song Jiang Battle Array while playing the game. After the design of the game and the user testing, an analysis of a questionnaire survey shows that 80% of the players believe that the game is useful to popularize culture, which proves that the game will achieve the purpose of edutainment.

Keywords: Digital games design, Taiwan folk customs and skills, Neimen Song Jiang Battle Array

1. Introduction

With the development of network technology and multimedia, digital games bring people with not only entertainment, but more importantly, the significance of cultural popularization and digital repository. The characters of a story are described in forms of visuals and audio-video effects through passing the levels of the games; the player can get the knowledge and enhance the learning efficiency by the interactive effect of the game; the counter effect of forcible absorption of the knowledge can be prevented by the interest of the game. Therefore, the local culture is promoted, the local folk-custom skills can be known by more people and Song Jiang Battle Array can be popularized in the form of games.

2. Literature Review

With the development and design of digital games as the starting point, this research describes not only the historical origin of the Song Jiang Battle Array in theory but also understands the whole history to provide convenience for the revision and mastery of the historical text. In addition, the definition of the digital game and the achievements of combining digital games and learning are discussed.

(1). Introduction of the Song Jiang Battle Array

Neimen Village of Kaohsiung County in Taiwan, originally named "Arhat Neimen," is a town with a population of merely 20,000 but has 40 arrays with an amazing high density. Among the 40 arrays of Neimen County, only the Song Jiang Battle Array has more than 20 teams. The Song Jiang Battle Array, a kind of martial art, distributes most widely in Tainan and Kaohsiung. It is often attached by temples and becomes the martial art in front of Buddha and God, while the martial art of Neimen County mostly belongs to the disciples (means amateurs) of Guan Yin in Zizhu Temple and is passed on for 130 or 140 years, becoming a community organization frequently taking practices. For the prosperity of the Song Jiang Battle Array in Neimen County, one reason is the martial arts spirit developing from the military training traced to the Ming-Zheng period, and the other is the legacy that the villagers united together to prevent looting by bandits from other places.

The Song Jiang Battle Array, which derives its name from the Heroes of the Marshes, consists of 36, 42arrays, or 56 performers holding the weapons belonging to 108 brave men of Heroes of the Marshes, including the blazing flag by the leader Song Jiang to issue orders, the double-slice axe used by Li Kui, the Black Whirlwind, the green dragon crescent blade, double blade and double port sun-moon blade, umbrellas, and etc... The formations of the Song Jiang Battle Array can be divided into the following types: i. obeisance etiquettes, ii. asking for cheers, iii lapping, iv. gathering flags (cranes) as signals, v. jumping inside and outside hoops with corners, vi. dragons rolling up water, vii. crossing the center, viii. individual weapons, ix. handstand off the circle, x. shattering the

centipedes array, xi. spiders making webs, xii. lifting and fighting, viii. white cranes' array, xiv. chain of rings without weapons, xv. eight trigrams array, and xvi. obeisance etiquettes. Among them, lifting and fighting is the most populous and excellent part of the whole performing process, possibly the favorite part from the audience. When each pair of performers is fighting each other with their weapons on the stage, the performance reflects fast and clear steps. Each sharp move seems the fighters are fighting to death, therefore it is also called "fight to death" (Wu, 1999).

Figure 1. Performance of the Song Jiang Battle Array.
Source: Elementary School of Xianggouping Village, Kaohsiung County

(2). Definition of digital games

Many individual definitions of digital games are made by scholars, for instance Wu Tiexiong(1988), a local scholar defines, "digital games are a kind of software that develop from the computer, with the function of entertainment and education". Another scholar, Hong Guoxun(2003), defines digital games as "a kind of game that uses electronic form and coordinates the composition language to show the game rules by screen." Despite the fact that these definitions are sourced from different people, they believe that the digital game is presented by computers.

(3). Features of digital games

A good digital game should contain many

essential elements and people generally give the similar definitions, but the reason referred by Prensky(2001) lies on the features of digital games:

i. Entertainment: Digital games can provide players with enjoyment and happiness during the gaming process.
ii. Playfulness: Digital games extensively attract players.
iii. Regularity: Digital games provide players with the whole framework of the games.
iv. Purpose: Digital games can promote the players to continue playing.
v. Interaction between players and computers: Digital games allow players to play games through operation and interaction with computers.
vi. Result and feedback: Digital games give players opportunities to learn.
vii. Adaption: Digital games enable smooth playing process for the players.
viii. Sense of victory: Digital games give players a sense of self-satisfaction.
ix. Competition, challenge, and sense of conflict: Digital games excite and thrill players.
x. Solving problems: Digital games stimulate players' creativity.
xi. Social interaction: Digital games allow players to form game community with other players.
xii. Image and plot: Digital games let players acquire feelings during playing games.

(4). Combination of digital games and learning

According to a number of researches , when youngsters are playing digital games, the learning activities in which they spend time to engage are more complex and challenging than that in normal schooling education (Gee, 2003; Kattenbelt, C. and J. Raessens., 2003; Gee, 2005, Becker, K., 2005). In the learning field, the digital game cannot be mentioned with the same breath, for it is not a learning activity that only requires low-level skills such as coordination of hands and eyes as well as speed training of eye sight (Greenfield, 1984). On the contrary, it has become a powerful and strong tool to take learning to a higher level by investment and research by scholars (Hsiao, 2007). Besides, some other scholars point out that the digital game has many learning contents as learners can acquire new thoughts in the game and can immerse in it that allows them to play different roles and have different ideas and opinions in different countries (Gee, 2003) such as game playing roles. In such a state, players can learn how to compete and acquire knowledge. This

kind of addiction and concentration produced in the game can be regarded as a convincing reason for bringing games into the learning environment (Hsiao, 2007). In recent years, other scholars have affirmed that learning through digital games can lead to positive educational effects (Prensky, 2001, 2003; Pivec, Dziabenko & Schinnerl, 2003; Kirriemuir & McFarlane 2004; Asgari & Kaufman, 2005).

Early scholars, such as Malone (1980), concluded that the reason for game stimulating motivation might lie in fantasy, challenge, curiosity, and control of the game contained by the games. Similarly, Prensky (2001) thought that the reason that digital games stimulate learner's learning motivation depends on "fun" and he also concludes the following features of digital games:

i. Digital games are a form of fun that gives players enjoyment and pleasure.
ii. Digital games are a form of playing that brings player's enjoyment of intense and passionate.
iii. Digital games have rules that can be observed by players
iv. Digital games have their own purpose, which gives player the motivation to move ahead.
v. Digital games are interactive and allow player to do things.
vi. Digital games have results and feedback, which help players acquire knowledge.
vii. Digital games are adaptive, allowing players to flow in it.
viii. Digital games can give players a sense of victory, which can make them feel self gratification.
ix. Digital games include conflict, competition, challenge, and opposition, which can stimulate the adrenaline.

Other scholars put forward different opinions on learning from digital games. They think the method of learning shall contain other elements, for instance, Felix and Johnston (1993) believe that dynamic visuals, rules, purpose, and interaction are essential elements for games and Baranauskas et. al. (2001) treats challenge and risk as important factors of gaming. Some Chinese scholars concluded and compared the features of games (Wu, 2007). The results are shown in table below:

Table   Features of digital games (Wu, 2007)

Features of the digital game	Prensky (2001)	Thornton & Cleveland (1990)	Felix & Johnston (1993)	Baranauskas, Neto & Borges (2001)	Malone (1981)	Garris, Ashler & Driskell (2002)
Rules	V		V			V
Purpose	V		V			V
Output and feedback	V					
Conflict/competition/ challenge/opposition	V			V	V	V
Interaction	V	V	V			
Image and Plot	V		V			
Risk				V		
Fantasy					V	V
Curiosity					V	V
Control					V	V

3.   Design Flow

This research takes Song Jiang Battle Array as its topic. By means of interactive teaching and digital games, the research is devoted to collecting materials on the Song Jiang Battle Array Game, mainly including story layouts, characters design, weapons and equipments, motion analysis of limbs fighting of the traditional art in Song Jiang Battle Array, and tactics for attack and defense. These materials are used to make the feasibility analysis and market positioning and valuing for the digital game design. It also intends to make more people understand Song Jiang Battle Array through education and entertainment existing in the Song Jiang Battle Array cultural game. The design flow of the game is showed as follows：
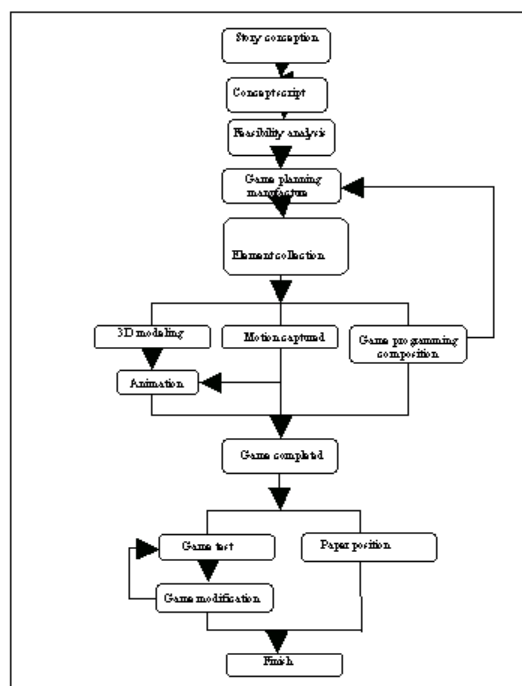

Figure 2. Design flow figure of the game

(1). Ideas of the game

This is a virtual game restoring the

conditions of Taiwan at the end of the Ming Dynasty. Based on the historical background of that time, we add some new concepts and hypotheses to enhance the game. The game can let player follow the pace of heroes, starting from contacting Song Jiang Array based on completely unknown, to gradually learn about it and till realization of the whole story.

(2). Proposal

When designing the game, we also converted all the details as a plan and completely recorded the design process out of nothing and collected them in the appendix of the research. An introduction of each chapter of the plan is showed as follows:

i. Preface and game motivation: introducing the reason behind creating the game
ii. Character introduction: introducing the original game roles and comparing them with those in the manuscript
iii. Story plot: describing the whole story of the game in detail
iv. Introducing the story levels: introducing the tasks and contents of the three levels respectively
v. Cultural background of Neimen: introducing the background of the game and the relevant history
vi. Introducing the weapons used in the game: introducing the usage and name of the weapon in the game
vii. Game interface: introducing the game interface and the function of the control buttons
viii. Game engine: introducing the engine for composition used by us
ix. Conclusion: introducing the expectations and improvement for the proposal

(3). Levels of the game

The game is designed with three levels: the first level is about the hero who needs to go to the Zizhu temple for getting the knowledge of the Zizhu Temple and the Song Jiang Battle Array. The hero needs to answer three questions correctly to enter the next level. The second level is about the hero who is going to attack the city. The hero can pass the level as long as he can defeat several Dutch soldiers defending the city. The third level is about fighting where the hero fights with the owner of the Dutch city. The hero has to use the collected treasure gas collection and protect himself by the protector to defeat the opponent.
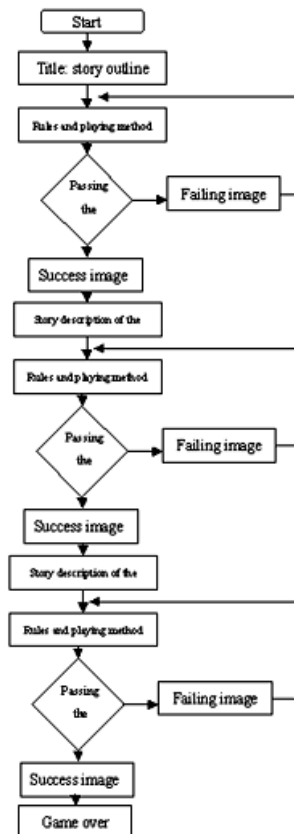
Figure 3. Flow figures of the game levels

(4). Motion capture

Motion Capture System - MOVEN is used to capture the fighting motion of the Song Jiang Battle Array. Based on the unique tiny inertia conveying inductor (MTx) and the wireless Xbus system, the system combines the latest Xsens technology including the efficient inductor which fit the limitation of Bio-mechanics. The captured materials of human body's motions by Moven will be transmitted to computers or lap-tops by wireless network to timely record and check the effect of the dynamic capturing.

Figure 4. Flesh-and -blood performers wear Moven motion-capturing inductor suits

(5). 3D modeling and animation

The 3ds Max, a 3d software can be used to implant the designed virtual roles with captured motions to make the motions of roles more vivid.

(6). Game programming

Virtools is a type of software which can be used for making multimedia interactive games. We can input the designed roles and scenes into the software and use its unique building blocks to write the program of game.

4. Result show

(1). Interactive fight form of Song Jiang Battle Array

This result sets up a total of three lens with different directions and owns two displaying way, namely, normal speed and low speed. It is expected that the operation connector and environment will be more convenient for the learner's observation. The method of switching the lens is to use the buttons of 1,2, and 3, camera1, camera2, camera3，on the switching keyboard to increase different angels to learn. In this group, 4 kinds of selection buttons, STOP, PAUSE, PLAY, and SLOWPLAY are made to enhance learning.
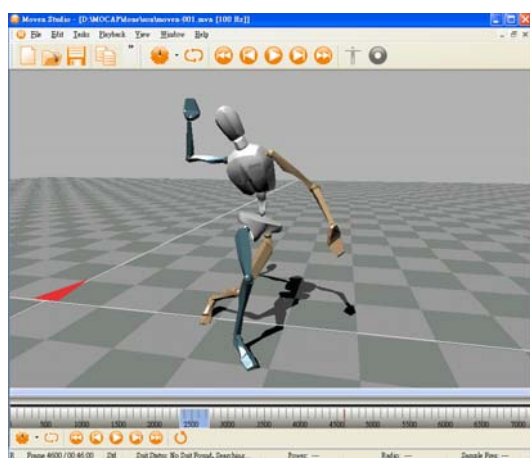
Figure 5. The framework image taken on MOVEN
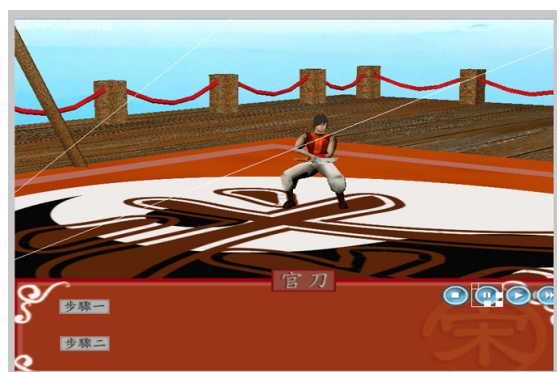
Figure 6. Watching the practice of the official blade from the frontal view

(2). Interactive Song Jiang Battle Array Game

Once the hero enters the Zizhu Temple, click the historical records, allusions, and methods of the Song Jiang Battle Array to read the relevant materials about Song Jiang Battle Array. After entering the first level, the hero will fight the Dutch soldiers and finally have a life-and-death battle with the owner of the Dutch city.

Figure 7. Entering the front of the Zizhu Temple in the historical record game

Figure 8. One sense of the Zizhu Temple-- clicking the weapon chart to read the weapons related to Song Jiang Battle Array

Figure 9. Introduction of the weapons in the weapon chart

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Figure 10 Fighting between the hero and the Dutch soldiers outside of the castle

5. Conclusion and suggestions

To achieve the completeness and spread of the culture, we take the game to 30 students from Qishan Primary School and Middle School and Shih Chien University for testing and questionnaire survey. The questionnaire survey contains mainly of the following four key points:

(1) Game contents.
(2) Game artistic design
(3) Game operation and usage.
(4) Culture and education spreading.

The analysis result of the questionnaire is showed as follows:
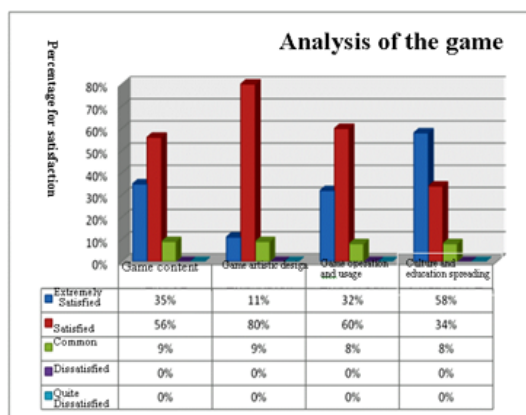
Figure 11.   Analysis of questionnaire results of the game

According to the questionnaire, 80% of the students like the game with the obvious and gorgeous appearance and agree that the game is useful to spread the Song-Jiang culture. The suggestions for improvement are as follows:

(1) With the complete contents, the game still needs some readjustment of details.
(2) The design of the game interface can be more colorful.
(3) The operation buttons need more functions.
(4) Besides the question collection of the Song Jiang Battle Array, other

cultural contents regarding Neimen County needs to be enriched.

The game has made the mold of teaching through lively activities and it is expected to develop the game toward the body-sense type where the players can give up playing the keyboard and mouse but use the Wii handle to play the game. In this way, in addition to visual reality, the players can also sense the reality of motions, which makes them feel like the hero of the game and can enjoy pleasure and happiness, and learn the essence of the traditional culture. Finally, with this research model, we do hope to drive the spreading of other traditional folk-custom culture add the traditional culture with the new package and added creative values and eventually endow the traditional culture with the new look with the integration of the technological innovations.

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Thoughts in Night Quiet: Exploring the Imagistic Dimension of Poetry through Digital Media

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Abstract

The aim of this paper is to investigate how the capacity of communication design and digital media can be used to explore the imagistic characteristics of Chinese poetry. This practice based design research paper focuses on two areas of enquiry, the phenomenon of digital media design and how ideas from outside of visual communication design can indicate the rational for design. A design prototype visualizing the work of the Chinese poet Li–Bai will not present as a completed design but will propose ways to visualize Chinese poetry through new media. It will, however, suggest how the provisional designs might sit within the further development of digital multimedia design especial for Chinese language related project.

Keywords: Digital media, Visual communication design, Chinese poetry, Imagistic dimension

1. Introduction

There are many poetry web sites and interactive CD-ROM titles related to poetry. Very few, however, use the visual dimension of these media to explore, extend and interpret poetic meaning. This scarcity of examples can be contrasted to the important interchange between poetry and other cultural fields like dance, painting, music and film. In each of these areas poems are frequently the central inspiration for new work in a second medium. The work of Li-Bai, for example, has been the basis for important works by Gustav Mahler, Tan Dun, Fu Tson, and Gau Cheng-Min, to list but a few examples.[1] Using Li-Bai's work, this design research project will investigate how communication design and digital media can be used to explore the imagistic characteristics of Chinese poetry. Apart from the enduring literary importance of Li-Bai's work, his poetry has been chosen for this study because Chinese literature scholars argue that visuality is central to its meaning and impact. Shyh-I Maa, for example, claims that 'Li-Bai always used the vision-shifting method, giving a series of floating pictures to us.'[2] In Li-Bai's work visual experience is evoked by the word pictures in the poem, suggesting scope for the visual interpretation of his work.

The use of poetry to project an image to the reader has been a central concern of Chinese poetics since the Spring and Autumn Period (770-476 B.C.). Professor Jing-Ell Chang argues that poems in the Tang Dynasty present a sequence of images, building into narrative form.[3] Chinese poets characteristically used methods of juxtaposition, ellipsis and simultaneity to produce a single still image in the mind of readers, and to stimulate new cognitive experience. We see this effect in a particularly evocative section of Li-Bai's poem 'Drinking Alone Beneath the Moon', which reads:

> I sing, and moon rocks back and forth;
> I dance, and shadow tumbles into pieces. [4]

These lines demonstrate the unique relationship that exists between the words and what they become through the reader's active projection of ideas into imagery. Design can amplify this visual dimension, giving birth to new visual relationships between the poem and reader.

Although diverse in form, the field of poetry represents the creative use of human language as an art form. Since the beginning of the modernist period poetry has been especially understood to communicate a poet's ideas, emotions and vision through strategies including metaphor, suggestion, symbol, reversal, description, allegory and hypothesis. Furthermore, according to the Taiwanese scholar Yan-Shang, the language of poetry frequently projects meaning through strong visual imagery, in combination with aesthetic qualities of tempo, modality, and abstraction.[5] Accordingly, the use of the formal elements of graphic design to evoke poetic meaning gains strong validity. It is the intention of this project to use design, in combination with visual imagery, to emphasize the expressive elements and visuality of Li-Bai's

poetry, bringing a new avenue of appreciation to his work for a sophisticated poetry audience.

2. The imagistic dimension of Chinese poetry

Another significant element in Li-Bai's work is its immediacy, due to its direct use of natural imagery. Historically nature has played an important role in the creation of Chinese poetry. For over two and a half thousand years, the imagery of Chinese poetry has been dedicated to understanding nature. Chinese culture has been profoundly influenced by both the Confucianist theory that human and nature are one, and the traditional Taoist phrase that 'The ways of Heaven are nature'. In Chinese culture nature is seen not only as offering material resources to humans but also as enriching people's psychological and spiritual life. Emphasizing the importance of nature was the basis for Chinese poets making natural imagery central to their work. Poems portraying natural beauty can be found in the earliest collection of Chinese poetry, the 'Book of Poetry', produced during the Spring and Autumn period (770-476 B.C.).

For Chinese poets, including Li-Bai, representing nature means exploring its inner meaning in order to explain the metaphysical relationship between humans and nature. In the Tang Dynasty, intellectuals, especially Li-Bai, were strongly influenced by Taoist philosophy, which taught that being at one with nature was the highest way to understanding metaphysical questions. In Li-Bai's poem 'Inexhaustible, Ching-t'ing Mountain and I gaze at each other, it alone remaining', the mountain is the metaphysical other to the poet, representing the brevity of human life. In many Chinese poems the poet and nature become one, serving as a metaphor for the nature of human existence. The practice of wandering through the countryside to reflect on important philosophical ideas was a fashion of literary society. The strategies Li-Bai developed for emerging his artistic life in the experience of nature included sailing down rivers, hundreds of miles in a day, or sitting in one place for a year.[6] Moreover, Li-Bai sought out wilderness areas and embraced the untamed, sublime dimensions of nature. David Hinton claims 'the most essential quality of Li-Bai's work is the way in which "wu-wei" spontaneity gives shape to his experience of the nature world. He is primarily engaged by the nature world in its wild rather than domestic forms.'[7] We can see this interest in the lines in 'Leaving Pai-Dih City Early' that read:

suddenly, no end to gibbons on

both banks howling,
my boat's breezed past ten
thousand crowded peaks.

This engagement with nature is a central element of Chinese poetic creativity, becoming the main subject for artistic focus. Guan-cheng Chu argues 'the subject of poetry, transferred from human to nature, liberates the imagery in poetry. It not only increases the creative subject but gives more depth of meaning to poems … [the discovery of nature] is an important event in the history of Chinese poetic development.'[8] Chinese poets portray nature not only to celebrate its physical beauty but to explore its inner motivations and implications. Such multiple uses are central to Chinese poetry's capacity to stimulate the reader's imagination, enabling them to explore the deeper meanings of the poetic subject.

3. Cross-cultural visual interpretation in the context of digital media

The creative development of a poem can be reflected in the visual development of a design. Designers use metaphoric elements to communicate complex ideas to their audience. Visualisation is one of the important creative resources for both poet and designers. Marjorie Elliott Bevlin claims 'There are specific steps to creating a design, but the most important aspect lies in the human inner faculties—the powers of imagination, intuition, will, and reason.'[9] The images in my experimental interactive poem are designed to give new shape and meaning to the interpretation of LiBai's poem. As the poet discovers and is inspired by the natural world, my designs seek to rediscover the unexpected beauty in the details of nature that surround us but which we seldom really see. In looking into such things and I seek to not only generate new possibilities for interpretation, but demonstrate the unique features of new media, for example, animation, rollover, sound, and tempo of sequences have stimulated our expectations of tradition narrative structure. The consequences for movable, mutable and morphable images, types, and graphics have introduced an innovative and theatrical consideration to the way we think about visual communication in the time-based media. Through arranging multi-layers design to enhance the significance also bring Chinese poetry to a revolution of visual dimensions of composite narratives.

In an age of globalization, meaning is inevitably negotiated between cultures. While there are inherent cross-cultural implications in the translation of traditional Chinese poetry into a digital multimedia context, globalization

challenges us to draw on the diverse sources of knowledge and understanding encapsulated in different cultures. Leong (2003) believes that 'homogeneous Western design thinking should be revised and reoriented', arguing that 'traditional Chinese creative thinking might provide [such] an alternative.' There are many instances of this being employed to challenge Western culture, extending its intellectual and creative development and inspiring innovation. For example, in the 1950s Cage challenged radical artistic values through two separate streams of Asian thought. Using the sounds of everyday life to reject the oppressive seriality of vanguard music, Cage took inspiration from Zen[10] whilst the *I Ching* inspired the use chance to contest values of conscious aesthetic decision-making. However Cage did not explore Zen or the *I Ching* on their own terms or for any issue they raised for Chinese culture, instead he saw them as a means to energize Western art. This project is different, using a cross-cultural mixing of aesthetic and thought traditions to explore the imagery of a poem in the context of digital media. Whilst bringing historical Chinese poetry into the digital age, it uses historical Chinese ideas of the interpretive agency and autonomy of the reader to extend the imagery of an ancient poem.

Leong argues, 'To go back to origins is to attempt to revitalize ideas and concepts that we are unaware or that might have become obscured over time (Leong 2003).' Classical Chinese poetry placed great importance on intuitive responses to the world, whereas Western modernity emphasizes rationality; exemplified by the influence of instrumental principles from human computer interface upon interaction design. The influence of Chinese culture is not apparent in the style of the interface but is rather present as a set of conceptual relations that drive interaction. The project also explores how digital design allows Chinese users to experience a reflexive, intertextual and multidimensional engagement with their heritage and identity, the words and themes of a canonical Chinese poem becoming the object, material and medium of exploration.

The mixing of Chinese literary structures and contemporary technology stretches meaning across time, space and cultural boundaries, in opposition to absolute, fixed information structures that enable communicative rationality. Where traditional Chinese culture and learning aimed to conserve meaning, the prototype challenges historically specific ways of reading Chinese poetry by empowering users to actively reconstruct aspects of the poem. In

contemporary Chinese societies cultural heritage is often used as an object of emotional identification. While the prototype uses classical poetry, it suggests ways of negotiating one's identity beyond appeals to ethnic heritage or an insistence upon cultural continuity. Underlying this approach is Laclau and Mouffe's argument that the meanings invested in identity are inherently unstable and in constant need of reiteration. They argue that labels like race and nation are discursive devices that mask or falsely unify difference (Laclau and Mouffe 1985). The prototype allows diasporic Chinese users to work through their relationship to cultural heritage through the reading of image, text and sound.

4. Grounding visual interpretation in a transitive model

The transposition of classic Chinese poetry into digital media demonstrates a richer, more complex level of interpretation. The content of the program, Li Po's poem *Leaving Paidih City early*, demonstrates the potential for heterogeneous meanings through its metaphorical dimensions and the interpretive vagueness of some Chinese characters. The words of Chinese poetry and the images and meanings these conjure afford the reader continual intellectual stimulation and depth of metaphysical meaning. Sundaranajan argues that in this dimension Chinese poetry suggests a transcendent spirit that refuses to settle for or be limited to any particular mode of being (Sundaranajan 2004).

In Chinese thought the openness of the mind to environmental stimuli is encapsulated in the Taoist concept of *Chi*, which simply explained is the universal energy that permeates, flows through and around - 'animating' everything and everyone. Western scholars see a parallel between Chinese poet's striving to capture the quality of *Chi* with modernist poet's interest in 'impulses' and 'intimations' (Sundaranajan 2004). Connections can also be made with designer's efforts 'to create iconic or symbolic messages, requiring decoding and interpretation from the viewer.' (Forlizzi and Lebbon 2003) But perhaps the greatest lesson for contemporary interaction designers discovered in the poet's concept of *Chi* is the need to create information structures and interaction processes where users dynamically co-construct meaning and experience.

In 1985 Eisner raised the idea of 'aesthetic modes of knowing', seeing creative activity as a form of reflective practice that

allowed people to make sense of things. Diasporic visuality may be a prime example of the effects that Eisner writes of, the work of diasporic visual artists revealing a capacity to reconstitute culture and meaning in critical ways. According to McFarlane (2004), 'diasporic visuality involves the deployment of tactics such as syncretism, irony, juxtapositioning and intercultural aesthetic cross-hatching which operate collectively to enact both the specificities of diasporic cultural identity and a cultural politics which challenges exclusionary norms of nationalist subjectivity and culture.' McFarlane sees cultural identity as being reconstituted in ways that escape contemporary cultural structures and understandings because of their complex and dynamic nature. Diasporic visuality is embedded in interpretative processes where individuals and communities attempt to understand their identity by negotiating a path between their present circumstances and their cultural roots. Consideration of this showed it was possible to develop a critical relationship to identity and this became intrinsic to the form and content of the project, which aimed for a much richer experience of interaction based around reflexive ways of seeing, knowing and understanding.

In the prototype, a movie sequence and few visual concepts, expresses new perspectives of visual interpretation, thereby allowing users to produce meanings beyond the scope of the original text (fig. 1, 2, 3). The associated elements, including images, graphics, texts and sounds that use in the movie sequence, allowed users to construct multiple renditions of the poem. The visual and aural materials of the sequence allow users to explore the codes of Chinese culture, its ideological discourses and their cultural literacy and positioning. As an example of the potential of new media the design allowed users to construct and perform identities and self-concepts through visualization (Lister 2004).

Figure 2. Visual concepts of the design process.

Figure 3. Movie sequence results from design prototype

As Butler suggests, the iteration of meaning is a continual occurrence in a culture and society that produces new cognitive positions and fresh ways to conceive the world. For Butler, iterative processes draws attention to the absence of essential, natural or ideal categories of meaning prior to each appearance within a causal chain, suggesting only continual shifts between pre-existing categories and new representations (Butler 1997). Postcolonial theory and theories of diasporic visuality challenge the division of the world into simple opposites. Both emphasize the individual and the cultural diversity of diasporic and colonized peoples, suggesting that while such individuals may stand apart as a group from their colonizers or from original populations, they are different one from each other despite their shared pasts, and should not be seen in a singular sense.

McFarlane argues that diasporic intervisuality can produce ironic outcomes, critically reflecting on the relationships between power, visuality, ethnicity and nationalism (McFarlane 2004). This idea of criticality drives the selection and organization of visual and aural elements in the design. The dimension of 'play' challenges traditional ways of seeing and reading in Chinese culture, positioning the user as an active producer of content. For McFarlane, 'diaspora can be experienced both as a dynamic

Figure 1. Visual concepts of the design process.

tension and as a space of opening in which issues such as the narratives and visualizations of nation and the politics and stylistic consequences of diasporic interventions into cultural practices can be explored (McFarlane 2004).' The potential of interactive multimedia to facilitate multiple viewpoints, double consciousness, differential pathways and in-betweenness is high if designers move beyond the current paradigm of clear communication and efficiency of use, replacing hierarchical patterns of use defined by the designer with interpolating experiences based around provisionality of meaning and the productiveness of users.

5. Open poetic visual interpretation

A plan or idea is frequently in the designer's mind before the process of design is begun, and the process happens as the result of artistic perception. Almost everyone can appreciate the beauty of a flower or a butterfly, but the potential application to design may not be immediately obvious. To discover the universe with sensitivity, absorbing impressions from every experience could inspire creativity. This observations practice is somehow reflecting the nature of the poetry creativity. In this design (fig.4), the detail flower pattern, might be interpret as a stage, and the flower stamen the light source. The letters represent insects gathering around the flower, but also figures dancing on a stage, performing with beauty and elegance. The suggested figure symbolizes the individual: the performer in their dream world.

The suggested and alternative meanings in single-word Chinese characters point the way to expansive interpretation of the Chinese text. Meaning may be derived from, or a combination of, the 'original' meaning of the poem, the general cultural literacy of the Chinese user or personal interpretations of the character. The initial presentation of elements is driven by the original order of words in the poem. From that point, the hermeneutic dimension is open to the user. The outcome amplifies the multiple meanings and visual possibilities already implied in the text while unleashing the user's imaginative engagement with cultural heritage. However it does this whilst still functioning within the parameters of the poem, which is always available as a point of reference in its original form.

Figure 4. Visual interpretation from design prototype
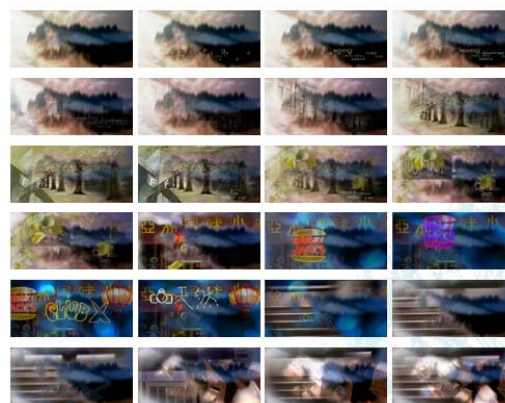
Figure 5. Movie sequence results from design prototype.

The visual elements had been created do not simply reflect meanings but provide a basis for its construction, making an experience that is productive *and* reflective. The conceptual organization of its elements enables the reconfiguration of the complex imagery of the poem. The user is encouraged to discover new ways of reading particular visual/textural elements suggested by different contexts. Through the combination of visual/aural elements, there are immeasurable possibilities to generate individual response to the poem (fig. 5). The design prototype offers a new dimension for understanding cultural text, and presents a form of creation between individual, digital media, designer and the content.

5 Conclusions

There are many Chinese web sites related to Chinese literature and poetry. Most sites are dense in text, having little interest in visual or design elements. Providing general information or analysis is their main aim. By comparison to Chinese literature and poetry web sites, western poetry web sites offer rich visual experiences. Many poets collaborate with designers and programmers, achieving a high level of visual design and strong conceptual impact (fig.6). Since 1996, the idea of 'internet literature' has been widely used by writers. Many Taiwanese poets, such as Pai Ling, Wen-Wey Shiu and Shaw-Lian Su, use internet literature as a powerful media for reaching a readership.

Professor Shuen-Shing Lee claims 'the flexibility and unique environment of digital creations is shifting communication methods away from tradition to new interactive circumstances; interactivities represent new aesthetic potential for expression.'[11] Writers who want to present their work in a new format, to elicit new experiences and creative dimensions, also seek to elicit new reading behavior through the use of new media. However, although poets endeavor to create visual dimensions to their work for their reader, due to lack of design expertise this dimension in their work is somewhat impoverished and literal, as the following examples suggest (fig.7).

Figure 6. Poetry web sites.

Figure 7. Poetry web sites.

This document interrogates the nature capacity of digital media. Whilst reflecting on the limitations of interpretation it suggests strategies to begin unleashing the creativity and productivity signified by the idea of user imagination. Such as Manovich (2001) suggests that the new media object is not fixed but something variable that can exist in different, potentially infinite versions. Yet such theoretical constructs fail to give specific directions to designers in how interpreting process and information structures that might enhance the creativity of digital media or empower users.

Notes

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7 Li Po, p.xiii.

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Digital Manual Script of Kong-Fu -Take The Tai Chi Chuan as an Example

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Abstract

The traditional pedagogy of Chinese martial arts is taught mostly through verbal instructions rather than visual aids. Therefore, it was necessary for beginners to start their lessons with professional instructors. Even the successors try to compile the knowledge or move they learned and translate it into drawing, it is hard to understand. The old school videos still create confusions in moves or positions. Countless people have given up on it not even halfway through their lessons due to various reasons as tricky mnemonics, wrong succession of moves, lack of practice, and lack of persistence etc. This study has examined Tai-Chi through "Virtual Reality", "subjective shot switching (to other angles)", "motion capturing techniques" with the intention of developing a set of digital martial arts lessons in order to create greater niche in general health. With the aid of VR/LCD goggles (or EyeTrek© by Olympus), users may switch between first person and third person angles to explore firsthand what it feels like to be in a real martial arts lesson or even better! This virtual reality experience is interactive and fun compared to the old, dull, fixed-angled videos on your TV shelves. This Tai-Chi digital lesson combines technology, art, and culture elements to improve shortcomings of traditional pedagogy of martial arts.

Keywords: Motion Capturing Techniques, Virtual Reality, Tai-Chi

1. Preface

With the economic development of Taiwan, recreation has become an indispensable part of daily life of citizens. Among the various recreational activities, sports have the positive effect on bodybuilding and health for busy citizens. Some citizens exercise in parks or stadiums in the early morning or at dusk. They dance, do gym or jogging, which are easy to do and benefits to health. Many citizens also learn broad and profound Chinese martial arts. It does not only build up the body but also defend oneself.

Most of the coaches of Chinese martial arts teach in live. The students practice on-the-scene. However, in case of raining or bad weather that is not suitable for outdoor activities, they can only learn from the paper martial arts lessons or VCR. If they stagnate for two to three days, or the trivial matters delay their practices, they will usually be wrong succession of moves. They may stop learning in halfway and cause bad progress. It is difficult for them to start the intention to practice again. Besides, the traditional Chinese martial arts are taught through verbal instructions rather than visual aids. There would unavoidable verbal mistake or the loss of ancient books and records.

This study integrates the cultural creation into digital contents. The Chinese martial arts can be transited and extended through digital contents. It does not only promote culture but also captures the motions of coach by Motion Capture equipment. Through the 3D Virtual Reality, the digitization of martial arts lessons can be collected.

1.1 Main purposes

(1) The tricky mnemonics is replaced by visual artistic conception. The 24 sets of moves of Yang's Tai-Chi are captured by motion capturing techniques. The virtual coaches with different styles are developed by the 3D computer motion, and are available for the student to choose. The chosen coach is more intimate. The virtual environment is full of artistic conception of Chinese landscape painting. This makes the user to engage in the movement of Tai-Chi naturally, increases the enjoyment of study and improves the vigor, mental status and spirit. This improves the learning method of traditional martial arts and the vision can promote the artistic conception of pithy formula.

(2) The Digital Manual Script is a platform for movement collection and demonstration.

Furthermore, the moves of the martial arts coach are captured by Motion Capture for collection. The achievement of self-study can be captured by WebCAM and saved as image files, or the single image can be combined to 3D virtual coaching. Then the difference of the movement can be compared and become the reference for the improvement of the moves in the future.

1.2 Scope of study

The scope of study is based on the Digital Manual Script of 24 sets of moves of Yang's Tai-Chi. It is compiled by the Motion Capturing System of Motion Analysis. The 3D coaches and scenes are manufactured by Autodesk 3ds Max. Then the MotionBuilder transforms TRC file to BVH format. Next, the 3D coaches are applied in Max and the movement will checked to see if there is any mistake. It is then exported to .X format of Director 3D. In the Quest3D VR, the interactive mechanism, scene and sound effect can be adjusted. The vision of user can be switched in the virtual scene. The moves of 3D coach can be viewed in different angles. The characteristic is that it is easy for beginners and elders to use. They will not abort using the digital contents due to the problem of accessing the computer. This study has adopted "24 Sets of Moves of Yang's Tai-Chi" as the system study and experimental subject of "Digital Manual Script". The present of the concept of "Digital Manual Script" is the main objective. The WebCAM is adopted in the function center. However, since there is restriction on the performance of the Laptop, only static images are captured for the comparison and review.

2. Literature Review

This study makes use of the relevant technology and equipment of VR (Virtual Reality) as the platform of the movement. The relevant literatures of application of Virtual Reality on digital contents and evolution of Digital Manual Script are arranged below.

2.1 Characteristics of Virtual Reality

In the films, most of the scenes of Virtual Reality are completed by special efficacy. However, the application domain in real life also involves the perception of users. William and Alan (2003: pp.6-11) have proposed the four main experiences: Virtual World, Immersion, Sensory Feedback and Interactivity. However, Burdea (1993) believes that if the view and operation are in the first person, the perception on operation is more intuitive and the interaction is more direct.

There are three important characteristics on Virtual Reality: Immersion, Interaction and Imagination. However, due to the difference of system, the strength of characteristics is also different. From the vision of the users, they can be

classified into three types according to the functionality: Closed CR, Open CR and Mixed VR. Xie (2000), Hong (2001) and Xu (2004) believe that the Virtual Reality cause significant effect to visual sense. Therefore, the visual view is the most important while present and operation is the auxiliary. They can be classified into four types: Immersive Reality System, Desktop /Internet Reality System, Simulation Reality and Concave Reality System. The characteristics of comprehensive view, present and operation is shown in Table 1.

Table 1. Comparison of the four types

Type	Peripheral equipment	Characteristics
Immersive Reality System / Cave VR	HMD (Head - Mounted Display), Data Glove, 3D mouse, Stereo, Data Suit, Force Feedback	Best integration of scenes, enjoy independently, hardware cost
Desktop / Web VR	General desktop PC, Mouse of trackball, Speaker, Joystick, Network	Limited integration of scenes, low cost, network connection, good interaction, enjoy independently
Simulation Reality VR	Workstation or mainframe computer, Large screen, Mouse or trackball, Speaker, Joystick, Network	Good integration of scenes, good interaction of network connection
Concave Reality System	Large projective equipment, Stereophony, 3D glasses	Good integration of scenes, share the views with multiply users, relatively bad interaction

2.2 Virtual Reality applying on digital pedagogy

In 1960, Heilig proposed the Head-Mounted Television concept. The images were moved to the front of the eyes. In 1973, Evan integrated HMD and a computer to Virtual Reality (William & Alan, 2003: pp.25-28). With the assistance of aside, narration of images or cartoons, and other accessories, the users could learn joyfully and attentively.

There are two main purposes of digital learning. One of them is the raise of knowledge and common sense. The other is the progression and improvement of behavior and limbs activity. For example, in the NICE project (Narrative, Immersive, Constructionist / Collaborative Environments), Barnes, et al. (1998) designed a small courtyard ecological environment for children specially. The children could comprehend the effect of sunshine, rainfall and even weeds. Through the cooperation in the network, they could cultivate and barber the courtyard ecology.

In multimedia learning, Simulation is the abstraction or simplification of actual scene or process. The participant always plays a role and has certain interaction with other participants and objects. The most special value of simulation is that the users can implement and learn directly and clearly. They can learn the skill from the simulated scene and apply it on actual life.

Gillingham, Johnson, Moher and Ohlsson (1999) have made use of VR technology to produce a simulated planetary world and educate the

children that the earth is round. The design even allows the children in two different locations to complete the task together through the network. The skill of activity should be obtained from action and feedback. It would be better to practice the skill in real situation. However, it is more convenience and safe to practice in simulated scene.

The Physical Education is knowledge for limbs activities. It would be a very important breakthrough on pedagogy providing the sports skills to students to repeat pause and stop viewing randomly in practical and prolonged time together with voice, effect and animation. The students can practice in the scene so that they are easier to achieve multiple objectives of cognition and skill. Heinich, Molenda and Russell (1992) had proposed that a successful pedagogy should include the following characteristics: subjective participation and interaction, practice, individual teaching, enhancement or feedback, and teamwork. It is strictly the requirement for physical education. Huang (1999) believes that the effect and convenience brought from VCR pedagogy can promote the achievement of learning objective, including sports cognition, skill and scene of the students.

"Study of Web3D Computer Assisted Teaching Material on Traditional Chinese Martial Arts Zhong-Yi-Quan" from Zhu (2002) made use of VRML 3.0 for development. There was no restriction on observing angle, and had better interaction, natural and real action, good sense of space and was applicable on network. However, the file size was too big and Plug-in is required. Therefore, the action was not smooth on network and the popularization was limited.

"Research and Development on Stretching Exercise Network 3D/VR Learning System for Office Workers" (Xu, 2004) had offered online learning of stretching exercise for office workers. It provided verbal services and relevant information for stretching exercise. However, 18% of users felt that the menu was not convenience to use and 15% of users felt that the execution of system was not smooth. Both of them accorded with the characteristics of successful pedagogy. However, the objective factors such as the broadband of network became the determinant that users were not willing to adopt them.

In 2004, the Klaus-Peter of Virtual Reality Laboratory of Engineering Institute in Michigan University of United States was in charge of the "The Virtual Football Trainer" project. The Immersive Reality System VR has been adopted. During the operation, the team members in the Virtual Reality looked like the real teammates. Through the database, the user could experience more than a hundred tactics and team actions. Besides, the flying route and placement of the ball could be designed and it was not affected or restricted by the weather. It was completely different with adult sport.

Cheng (2003) proposed "Research and development of Network 3D/VR Infant Rhythm Teaching Support System" in 2003. It had positive effect to the exercise ability and confidence of the infant in the future. The course of eurhythmy had been established together. The course of in-service training was also offered so that the teachers who wanted to engage in infant rhythm teaching had the chance and channel to receive training. The learning scene was suitable for the age of the users. There was a humanized interactive design and database. The music coordinated with the action.

In order to complete the 3D/VR Infant Rhythm Teaching Support System, the Department of Physical Education and Department of early Childhood Education exchanged to each other. However, the files were still too big and the problem of coordination between music and rhythm were still waiting to be solved.

Yang (2006) made use of digital video to assist reviewing the action. The digital camera was adopted to take the actions of the students. Then the video signal was digitized by computer. Through stop motion and slow motion, the actions of the students could be explained.

"The Development of a Web Based 3D/VR Tai Chi Chuan Learning System - the Forty-two Movements Style) studied by Xu (2005) and "National College of Physical Education Tai-Chi Digital Collection Scheme" announced in 2007 carried forward this idea. Through the 3D technology, the teaching and reference could be conducted in different angles. The system could also play in normal speed, stop motion and slow motion. The visual angle could also be switched (Figure 1).

Figure 1. National College of Physical Education Tai-Chi Digital Collection Scheme

In the early of 1990's, "What You See Is What You Get" (WYSIWYG) was the direct manipulation for most of the information products. Besides, from the psychological point of view, the

feedback from the direct manipulation reduces the mistake from using during the operation. The physical, spatial and visual icons seem easier to remember and operate than those text and values. Besides, the "operation" stated in "direct manipulation" include: the Pointing, Clicking, Selecting and Drag & Drop of existing input device. Therefore, direct manipulation involves two advantages, including " What You See Is What You Get " and "suitable for all levels of users". The users control the objects instead of entering commands with complicated syntax. Any modification can be reflected to users at once. Besides, the operation is revertible. The essential conditions for direct manipulation include: not necessary or easy to learn, not easy to forget, unanimous layout, easy to operate for elders, young and general users (Czaja & Lee, 2002; Zeng , 2004: p.36).

2.3 Pattern and evolution of martial arts lessons

As early as 2000 years ago, Lao-Tzu proposed "Learns from nature", and enlightened people to learn from and follow nature. In the third century B.C., Buddhism entered China. Some scholars functioned as rivals and they have established Taoism. Based on immortal theory, Lao-Tzu Li Er has been elected as the progenitor of Taoism. In dynasty Sung and Yuan, martial art was popular. They were divided into nine major factions, including Wudang, Shaolin, Kunlun, Huashan, Tianshan, Xueshan, Qianshan, Emei and Kongtong (Li, 2004). The attack and defend skill has been accumulated from early dynasty Qin. The relevant military art theory has been summarized repeatedly after the Dynasty Qin and Han. The martial art theory has been established in Dynasty Qing (Cui & Chang, 1993:p.224).

Coeng Nai Zhou is the person who creates and propagates "Coeng Martial Art" in early Dynasty Qing. The "Yi" has been regarded as the origin of the theory. The channel theory from Chinese medicine and "Yin-Yang experts" has been the reference to explain the theory of martial art. The writings include "Zhong Qi Theory". Another outstanding characteristic of Coeng martial art is that the martial arts lessons include excellent pictures and texts, which can be rated as unique accomplishment in martial arts. According to a survey in China Mainland conducted in 30s of last century, there have been over 2000 sets pattern of martial arts in China and the basin of Yellow River. However, only 280 sets pattern of martial arts have been dug out. Over half of them only have the name but no successor practices it. Only dozen of martial arts have certain amount of successors, including Tai Zu Martial Art and Coeng Martial Art. Though the Coeng Martial Arts lessons include excellent pictures and texts, there is risk to fail to be handed down from past generations. The

situation for other martial art is more difficult. (Dwnews.com, 2006)

In the Qianlong period of Dynasty Qing, Qang Zong Yue wrote "Tai-Chi Theory". The name of Tai-Chi has been established. There are many opinions about the origin. However, the Tai-Chi is passed on from generation to generation in Chen family. The Chen family knows about that and all of the members practice this martial art. When it passed on 14 generations Chen Chang Xing (1771-1853), it was passed on the person with different surname Yang Lu Shan. Since then, there are different evolvements of Chen's Type Tai-Chi has been. They mainly include Yang's, Wu's, Sun's and Wu Type. Due to the special efficacy of Tai-Chi, the learning motivation for everyone is different. Therefore, the development appears variety. Recently, it even becomes the competition in international games. For example: the 42 Sets Tai-Chi Competition in 1990 Asian Games have integrated the moves from Yang's, Chen's, Wu type and Sun's. They form the comprehensive characteristics and demonstrate the compatibility. Beginning from 1950s, China Mainland has popularized Tai-Chi and it becomes a major healthy exercise for the public. The 24 Sets Tai-Chi has been established for which it is based on Yang's Da-Jia Tai-Chi. In 1957, the "Tai-Chi Exercise" has been published. The purpose is to provide a teaching material and standard for the learning of Yang's Da-Jia Tai-Chi. Since the movement of Yang's Da-Jia Tai-Chi is elegant, and is easy to learn and practice. The efficacy of building up the body is excellent and is welcome by the public. It is the most popular types Tai-Chi. (Yang's Tai-Chi Website, 2004)

3. Approach and Steps of Study

The system architecture is shown as Figure 2. It adopts the software and hardware of Motion Analysis as the motion-capturing tool. The Real-Time Track and Display Module and Solver-NT-SL-NT MoCap Sol are the infrastructure of the system. The motion data will be adjusted in Autodesk Motion Builder and will be applied in the 3D role produced by Autodesk 3ds Max. The finished role are required to export and transfer to Director X format, and then import to Quest3D VR Edition. All the interaction will be finished in Quest3D, including role, clothing, scenes and music. The finished contents can be viewed from the GV50-3D Video Eyewear of Oriscape Electronics Company. The motion of practice is captured by the WebCAM and will be compared with the motion of the 3D coaches later.
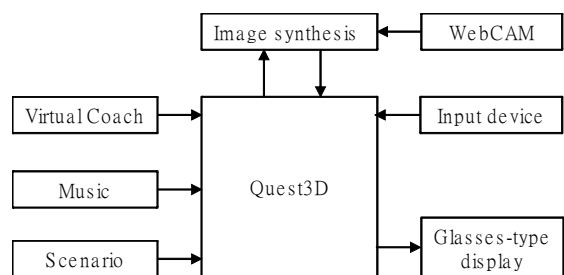
Figure 2. System Architecture

This study has integrated and developed the new platform for the contents of Digital Manual Script and the demonstration of limbs motion. Through wearing the Video Eyewear and practice, it has been verified that angle switching can definitely provide recreation and promote the interest in study. With the reference of design logos of Instruction System Design (ISD) from Jiang, Wang and Chang (2003), and Exercise Skill Multimedia CAI System Design and Development from He and Zhu (1999), the steps are divided into seven stages:

(1) Define the questions of this study. According to the information of literatures, the questions to be solved in this study are defined.

(2) Establish the purpose and contents of study. The purpose of study is clarified and the 24 Sets Yang's Tai-Chi is the sample of the study.

(3) Establish the study approach. The 3D digital motion demonstration platform is designed in accordance with the purposes and contents of study.

(4) Establish the demonstration platform for Digital Manual Script. According to the study approach, capture the sample of demonstrating motion. Produce a demonstration platform for action that can switch the viewing angle and is easy to operate.

(5) Practically operate the Digital Manual Script. The Immersive Reality System VR is adopted for verification. It makes use of the Video Eyewear to view and practice for 20 minutes. From the records of interviews, it is verified that the efficacy is better than those of traditional practice of martial art is. Totally ten testers with and without digital learning experience have participated in the experiment. The duration of experiment is around 20 minutes and there will be an interview after the experiment.

(6) Adjust the system and solve the relevant problems. The Tai-Chi expert is invited to verify the exactness of the moves. Besides, the citizen who is interested in learning Tai-Chi can attempt to wear the Video Eyewear and operate the system. The interviews and records can assist to find the shortcomings and propose suggestion.

4. Achievements and Discussions

This study has integrated Motion Analysis, Autodesk 3ds Max, Autodesk Motion Builder, Quest3D VR Edition. The high-tech or distinct artistic design is avoided. The experience in our daily life will be the basis of the design. The special design is only available in scene options. Moreover, the intellectual elder is adopted as the model to produce the virtual coaches and scenes. The design of user interface comes from daily life. The direct manipulation is adopted. It is easy for users to learn and they are not easy to forget. The achievements include the following:

The user interface. From the new 3D user interface, the view angle can be switched so that the motion of the virtual coaches can be viewed from different angles (Figure 3) and it is different from that traditional dead angle. The wheel of the mouse can partial enlarges the image so that the details of the motion can be viewed clearly. The 3D image is resolved in real time and is highly interactive. This satisfies the different view angles of the users. However, several problems may cause trouble: (1) the interface of direct manipulation will occupy much valuable space of the screen. This will cause part of the important information displaying out of the screen. (2) The icons may be misleading. Therefore, practical test must be conducted in order to modify the interfaces that may cause misleading.

Figure 3. Viewing from any angle

The footprints of motion can be shown so that it is convenience for the users to distinguish their moving paths (Figure 4). This is an indication for the users and it can reduce the uneasiness in study. Although the motion of virtual coach is 100% consistency and it will never make a mistake, this may lead to ossification. Everyone have their own physique and it is not possible to match with all motions. Therefore, real coaches are still necessary.

Figure 4. Moving paths

The motion of the user can be captured by WebCAM for comparison afterwards (Figure 5). Single shot or animation is available for comparison afterwards. This can improve the learning. In addition, the images can be sent to the coach in remote site and achieve real distance learning.

Figure 5. User interface and the image of user captured by WebCAM

5. Conclusions and Suggestions

Though there is certain discrepancy between expectation and the result, most of the achievement is identical with the expectancy:

(1) the video eyewear provides a closed visual effect to the users and they can learn more attentively.

(2) Music options are available that makes users to merge to the scenes more easily.

(3) The switching of visual angle solves the problem of visual dead angle that has been troubled for long time.

(4) The motion during the practice can be frozen and the visual angle can be switched. Though the coach is not around, the problem can still be solved.

(5) The practicing speed is adjustable so that the beginners feel free from worry and they need not follow the motion irritably. If they meet anything unclear, they can view repeatedly.

This will not have any psychological burden that is caused by asking the coach repeating the motion.

(6) If one wants to know their moving path, it can be simply accomplished by pressing the Practice Step Icon and the complete moving path will be shown.

(7) Taking the own images by the WebCAM for comparison is the most welcoming function.

Though it is reviewed manually, the expansibility in the future is expectable. There is room for improvement of the product. If it is possible to integrate and obtain more resources, the following items can be enhanced and extended:

(1) capture and analyze the real time image. Through the analysis of the image, the image captured by WebCAM can be compared with 3D virtual coach.

(2) Manage the network community. People with the same habit can share what they have learned on practicing the martial arts, and they can even discuss and demonstrate in real time. The Blog is extremely popular nowadays. It can be predicted that network community is the foundation of economics. There are infinite business communities if the communities can be administrated effectively.

(3) Make use of the Head tracking video eyewear to correspond with the viewing angle of the virtual scene. It can match with the viewing angle identically and the 3D visual effect will be more realistic.

(4) Make use of the Force Feedback Glove and add the mechanism to fight each other.

(5) Regarding the digital contents, in addition to other Chinese martial arts, it is applicable to any gentle limbs exercise, such as Yoga, gymnastics, dance and demonstration of motion (such as CPR, bandaging skill, operation of the dangerous apparatus and remote control from different location).

(6) Simulate the scene through the WebCAM. The simulated scene is not limited to 3D scene, it can also replace taking photograph in real environment. For example, Google offers the network photographic mechanism. It imitates similar method to setup the WebCAM in the scenic spots. The image captured from local can be used for the background.

(7) The verbal control can reduce the use of mouse. This reduces the load of user on operation during the practice process.

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A Study on Calligraphic Fonts for Corporate Identity Design

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Abstract

Chinese fonts have been used in computing for more than twenty years. Much of the software has been developed using or including Chinese fonts. However, all of the computer operating systems were originally designed for Western languages, and then the application of Chinese fonts has been limited. Thus, Chinese fonts are created with character combination methods, in basic applications such as Fine Ming Script and Standard Kai Script. The displayed or printed Chinese characters are merely for conveying meaning, and aesthetic presentation is ignored. Chinese corporations must bring more of an emphasis on Chinese culture to their corporate image, in an environment that would otherwise approach homogeneous design. This research integrates Chinese calligraphic fonts into the network platform, as a source for the creative design of corporate trademarks.

Keywords：Chinese calligraphic fonts, Calligraphic Script

1. Introduction

1.1 Motivation of the research

Most research in the area is limited to studies of editorial fonts and fonts used in office applications. For example, Huang (1996) conducted semantic analytical experiments using Chinese fonts. He analyzes and compares appearances and structural traits of Chinese characters in Ming Font. He also findings suggest designers and non-designers alike view Ming font as modern and concise. The comparative analysis of calligraphic characters is not covered. Lin (1993) uses the Semantic Differential method to analyze the images of characters in her "Investigative Research of Images of Chinese and Western Fonts".

1.2 Purpose

The art of calligraphy that has been passed down for thousands of years is becoming less and less used and appreciated in this modern, computerized era. Yet the preservation of unique local features will become ever more important as a way for corporations to maintain cultural identity within the process of globalization. Chinese corporations must bring more of an emphasis on Chinese culture to their corporate image, in an environment that would otherwise approach homogeneous design. This research integrates Chinese calligraphic fonts into the network platform, as a source for the creative design of corporate trademarks.

2. Background study

2.1 The Value of Calligraphy for Design

Chinese calligraphy is one of the immortal arts of the world, with a beauty and simplicity both fluent and gentle, vibrant and powerful. Western culture holds this art of writing in high regard. Calligraphy may be the most important representative of art and heritage for the Chinese people (Yang & Zhu 2007; Zhu 2007). Calligraphy is not simply a vehicle of meaning for the Chinese people; it is also an exquisite manifestation of beauty.

Chinese calligraphic texts have a long history (Yang & Zhu 2007; Zhu 2007). They are a valuable national asset and a cultural legacy recognized world-wide. These texts also remain important as educational tools, yet are somewhat limited to this function (Yang & Zhu 2007). This project aims to make calligraphic fonts from ancient texts digitally available for use in design.

Most digitization of ancient scripts is accomplished by merely scanning the whole page and producing bitmap files, which achieves the purpose of digitizing and duplicating the original, but does not create a standard font for the design of corporate identity (Zheng 2004; Gong 2005). This project proposes a different method. Picture files of digitized scripts are transformed into full vector

files through a vector engine, and the image components are further decomposed to generate extra vector files. This increases efficiency in digital applications and searches. There are many potential applications for the vector calligraphic fonts.

Decomposed vector graphics may preserve the authenticity of calligraphy for practical uses; they can be arranged and rotated at will, and magnified or compressed without distortion. After decomposing the full vector picture, every component can be extracted for rearrangement, rotation, color change, or change of outer frame. File sizes are smaller, making them suitable for Internet broadcasting. A single-factor database can break through the bottleneck of searching through books and other materials, broadening the scope of application (Figure 2.1-1).

Figure 2.1-1. Advantage of vectorized ancient script.

2.2 Procedure for Vectorizing Calligraphic Script

Calligraphic script currently has very limited digital application other than for academic reference (Yang & Zhu 2007; Zhu 2007). Some software companies have already transformed scripts from ancient books into vector material (Zhu 2007). The next step is to apply such technology in the conversion of calligraphic script to vector format to create a complete set of ancient texts that may be used in the design of corporate identity. This can enrich design teaching materials as well as establish a new trend in the use of calligraphic script in design (Figure 2.2-1).
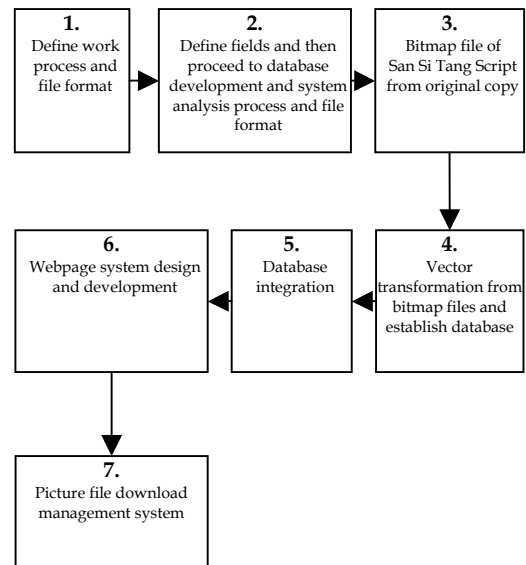

Figure 2.2-1. Procedure of vectorizing calligraphic script.

3. Contents of research

3.1 Source

The San Si Tang Book of Scripts is the primary source for this project. Once this material is digitized, it can be widely used in art, design and education. It could potentially become a basic tool in Chinese language education.

The San Si Tang Book of Scripts is most complete collection of cursive and rapid cursive scripts in the history of calligraphy (McNair 1994). Emperor Qianlong of the Qing Dynasty (1736-1796), a calligraphy enthusiast, made a tremendous effort to organize collections of calligraphy, compiling 340 pieces of calligraphic art and 495 types of rubbings from 134 celebrated calligraphic artists from the Wei – Jin Era (220–589 A.D.) onwards. Every item is a Chinese cultural legacy. Emperor Qianlong ordered these scripts to be engraved on stones, producing 32 books of rubbings in four volumes (McNair 1994). The titles of the books were inscribed by Chang, Buo-yin of Qing Dynasty. The First San Si Tang Book of Scripts is the most complete of these, containing collections of calligraphy from more than 500 writers in the Tang, Sung, Yuan, Ming, and Qing dynasties in the three major script styles of regular, cursive, and rapid cursive. A search system of vectorized ancient scripts will thus provide a thorough and authoritative reference.

3.2 Process

This project is somewhat complicated due to the vast amount of material and the large

number of vector files that need to be transformed and decomposed. However, the result will include authentic calligraphic writings as well as other ancient block prints, picture copybooks, rubbings of engravings and decorative patterns. The process of creating the networked database is described in Figure 3.2-2.
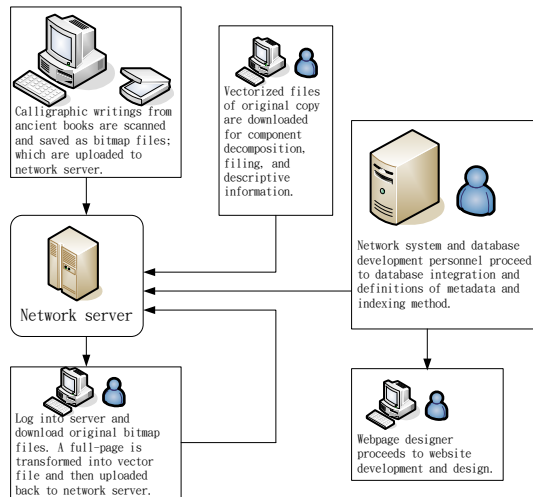

Fig. 3.2-2 Work method and process.

The transformation from the original bitmap files into vector files adopts the WMF file format, which supports all application software and allows the decomposition of full-page vector files to further isolate single components of the picture and to create an independent vector file. Figure 3.2-3 outlines useful outcomes for each stage of the process of conversion.

3.3 Creation of the Database

The creation of the database requires five steps (Figure 3.3-1):

Scan original copy: Books of rubbings and ancient texts are scanned and saved as original picture files in color JPEG format.

Vector transformation: Picture files are color-proofed and edited before the full-page bitmap files are transformed into vector files. Files are then uploaded to the network server.

Component and decomposition: Full-page vector files are downloaded and decomposed with vector graphic software. Components are saved as individual vector files and then uploaded to the server.

Development of the database system: This includes web page system analysis and planning, web page design, database integration, security setup and ongoing management of the system.
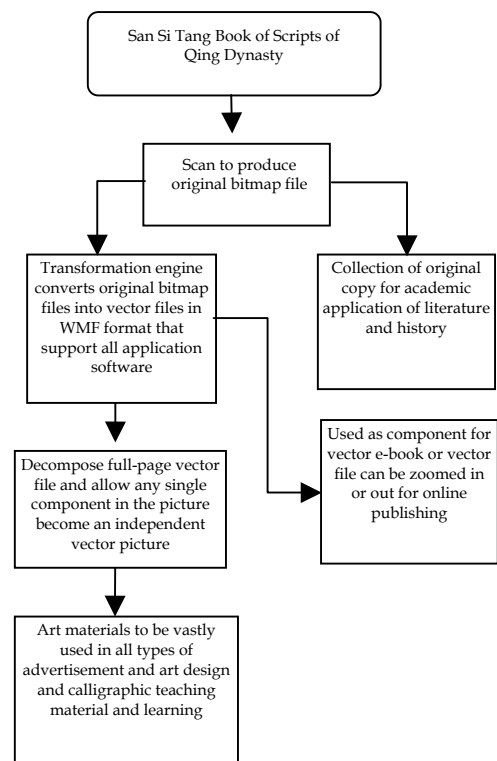

Figure 3.2-3. Outcomes of each stage of conversion.

Database categorization: The database structure includes dynasty, writer, source, origin, script type, book title, title of individual calligraphic item, bitmap page, vector page, page code, decomposed single character and description.
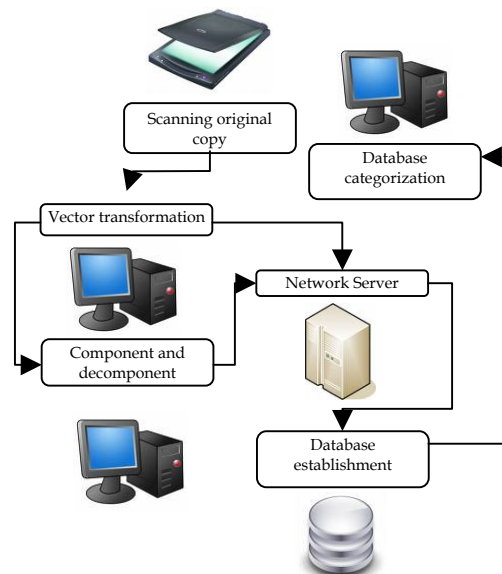

Figure 3.3-1. Database server structure.

3.4   Search Systems

Due to the tremendous amount of data, the development of the search system must be conducted in several separate databases to speed up users' inquiries.   The search databases will include an ancient book database and a search database (see Table 3.4-1).   The search engine can manage vocabulary inquiries, multiple vocabulary inquiries, and full text searches using basic information.   In addition, the features of each ancient script will be displayed in the categories of dynasty, writer, original script source, script compilation/book, painting or writing styles, and forms of composition as illustrated in Table 3.4-2.

Table 3.4-1 Description of database categorization.

Ancient book database	Search database
Storage index	Storage index
Dynasty code	Dynasty code
Writer code	Writer code
Unit/Original script code	Unit/Original script code
Compilation/Book code	Unit/Original Script code
Dynasty name	Compilation/Book code
Writer name	File name of component/ writing or painting
Unit/Original Script code	Component index value
Compilation/Book code	
Description of writer	
Description of Unit/Original	
Category of writing of painting	
Description of basic information	

Table 3.4-2 Criteria for search.

Inquiry criteria offered	Filter criteria offered
Vocabulary inquiry	Dynasty
Multiple vocabulary inquiry	Writer
Full text search of basic information	Original script
	Compilation/Book
	Category and form of writing or painting

4 Network System Frameworks

This project utilizes digital marketing and establishes a complete network platform.   On commercial websites, particularly those with the option of immediate online payment, product accessibility is often the key factor of website approval.

The platform has two major product areas. The first is the vector material itself, which can be selected, paid for and delivered immediately online.   The other is the corporate identity design application.   A consumer may place an order for the creative product developed in this project through the completed online payment solution to realize the purpose of real time sales (Figure 4-1).
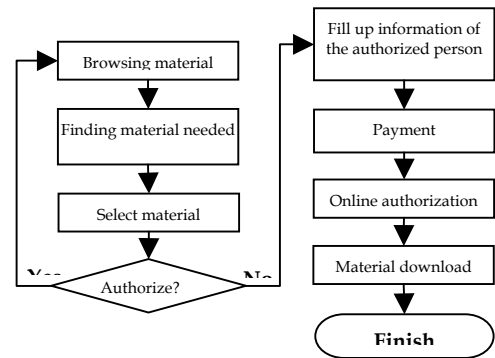
Figure 4-1. Material authorization process.

Efficient online delivery is one of the major benefits of this system; anyone can browse the system quickly and thoroughly, make payment and download vector files.   The workflow of the network system is illustrated in Figure 4-2.
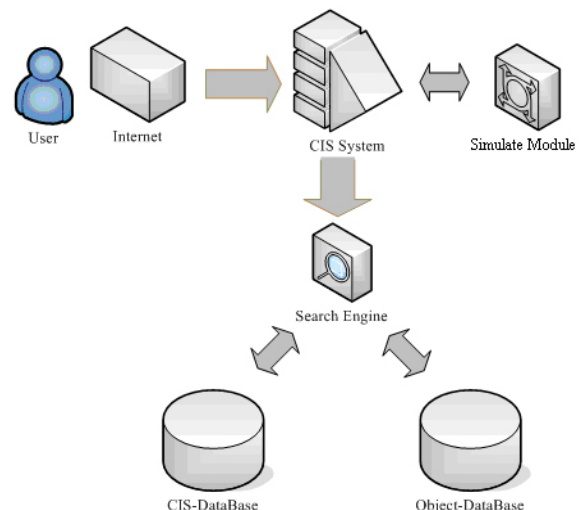
Figure 4-2. System operation framework.

4.1 Programming

This project leaves most of the dynamic webpage tasks to the autonomous operation and management of the system.   The underlying programming is therefore quite complicated. In

order to increase efficiency, many computation logics must be divided into different modules, each of which is then developed as an independent operation command. Commands are deployed in different computing layers to comply with a computation environment of N-Tier.

The most obvious choice of method for the development of N-Tier computation is object-oriented application development. Objects required by the system and the relationships between objects are recognized according to the functional requirements of the system, to develop objects with a high coherence and a low degree of coupling. Such objects may improve the frequency of use, reduce the time and cost required for system development, and increases the system reliability, allowing fast searching and multi-window.

4.2 Application of Calligraphy for Design

The focus of this section is using calligraphic typeface in commercial corporate identification design. Based on the calligraphy artists' works collected in the San Si Tang Book of Scripts, a platform to convert names between Mandarin Chinese and English with calligraphic typeface is developed. With such Chinese and English names conversion, more people may appreciate the beauty of calligraphic art, and businesses may easily adopt calligraphic typeface for their brand names for more international awareness.

As a result, we convert English names into Chinese with the transliteration method using the typefaces of reputed calligraphic artists in the history. Users may choose their preferred celebrity artist's typeface, search by words to find the artist, source, and his respective dynasty, and appreciate the original artworks. For example, a user may choose the typeface from Wang Si-jhih, a calligraphic artist, to generate the user's name in Wang's typeface and store it in a private and independent space on the internet for use at any time. Customized commercial design is the current trend; examples of use of calligraphic typeface include personal business card, tattoo, and electronic signature on a personal blog. Adopting Chinese calligraphic arts in daily life is a rarely seen application in the past. Below is the detailed description.

(1) Collection/Statistic/Establishment of the Database of Common English Names:

The collection, statistic, and establishment of the Common English Name Database are done so by first name, middle name, and last name, as well as by gender. The translation adopts Roman phonetic spelling. The structure of the database is illustrated in Figure 4.2-1.

(2) Finding the missing character by cross-referencing the Calligraphic Artists Typeface Database and the Chinese/English Name Database:

Once the Common English Name Database is completed, a cross-reference with the Chinese characters collected in the Calligraphic Artists Typeface Database is still required to find out the missing characters for the calligraphic character addition task in the later stage. The process of cross-reference is illustrated in Figure 4.2-2.

(3) Adding the missing calligraphic characters:

The missing characters are added in a two-stage process. In the first stage, the scripts that are not digitized are combed through for the missing characters, and the San Si Tang Book of Script is the primary source of reference. The second stage is synthetic addition of characters only available at modern times. To maintain the original style of the calligraphic typeface, vector graphics software is used for the "assembling" task, as illustrated in Figure 4.2-3.

Step 1: The typeface of the characters that need to be assembled is disassembled and categorized into components.

Step 2: Find the appropriate components from the completed vector graphic files, and use vector graphics software to extract such components and save them separately.

Step 3: Use vector graphics software to reassemble and resize the separately saved vector graphic files to make new characters.

Step 4: Aesthetic supervisor inspects the new characters; if approved, then the character assembling is completed.
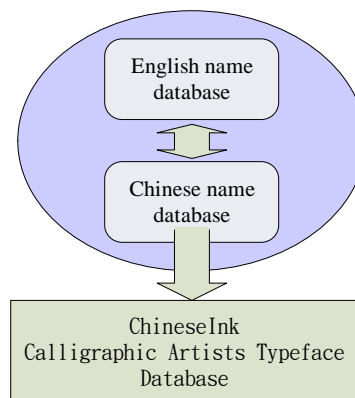

Fig. 4.2-1 The structure of Chinese/English Name Database.
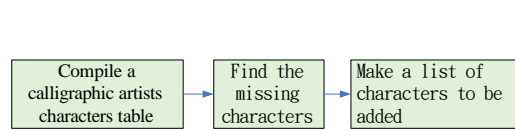
Figure 4.2-2. Process of cross-referencing for the missing characters.
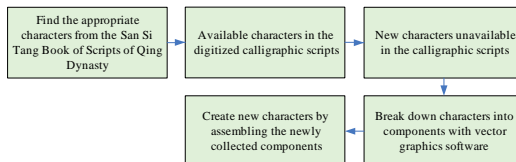
Figure 4.2-3. Process of character addition.

(4) The optimum inquiry method for calligraphic character in the San Si Tang Book of Scripts:

Currently almost 400,000 calligraphic characters from the San Si Tang Book of Scripts have been converted into a vector graphic format, along with more than 10,000 vocabularies. Too many characters of the same meaning will confuse users, and our solution is adopting recommendation of characters as the optimal inquiry method (Figure 4.2-4).
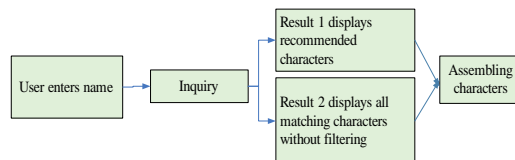
Figure 4.2-4. Optimal Inquiry Method.

(5) Selection of recommended characters:

Ten recommended characters will be selected automatically from the San Si Tang Book of Scripts in the order of frequency of use. These recommended characters are displayed as the result of the inquiry on the top for user's convenience. If the user is not satisfied with these ten characters, then another interface offers all matching characters from the database (Figure 4.2-5).
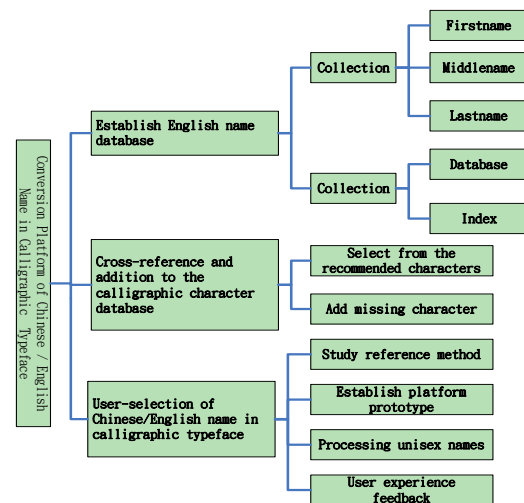
Fig. 4.2-5 Conversion Platform of Chinese/English Name in Calligraphic Typeface.

(6) Operation procedure for Chinese/English Name Conversion System:

The development of the platform has been completed, and the test, user experience feedback, and system adjustment are ongoing. The operation procedure for the completed platform is illustrated in Figure 4.2-6. Screenshots of the operation of the conversion system:

Step 1: User enters English name (Figure 4.2-7)

Step 2: Result of Chinese/English name conversion (Figure 4.2-8)

Step 3: Conversion to Chinese name is completed for preview or saving to a file. (Figure 4.2-9).
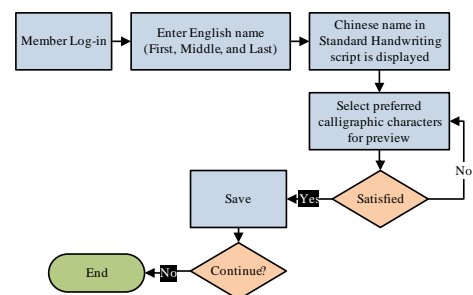
Fig. 4.2-6 Operation procedures for Chinese/English Name Conversion System.

Fig. 4.2-7 Interface for entering English name.
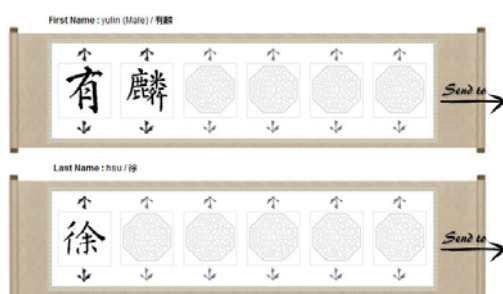
Fig. 4.2-8 Result of Chinese/English name conversion.

Fig. 4.2-9 Completed conversions to Chinese name for preview or saving to a file.

5. Conclusions

The flourishing online media and the technology-integrated corporate identification design in recent years have caused tremendous changes. Digital design has introduced a variety of alternatives in the concept, communication, and process of design. Digitalization has standardized texts, colors, and images through the platform of the internet.

(1) This research describes an evolving set of tools that are under continual development and refinement.

(2) Customers may be involved in an iterative design process, resulting in the design of a logo or trademark, with the possibility of incorporating calligraphic text in their designs.

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Wayfinding in Museum Environments

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ABSTRACT

The National Science and Technology Museum (NSTM) is the case study of this research. This research is interested in the application of digital technology, incorporating a form of humanized interaction, to the digital wayfinding device/tool for future possible development for use in the indoor museum environment. A wayfinding system (e.g. paper map, sign) is a channel of communication with people as they locate themselves in the museum environment. The tape player was an early guidance device that sent the message by straight-line to people, however, the rate of technological change in the world has been rapid and various multimedia devices or facilities (e.g. Kiosk, PDA) have been popular forms of communication and information provision in use in the museum. After reference to a majority of reviews, it is evident that the current wayfinding system is unable to provide both sufficient and efficient information for people as they need to orient their location in a specific environment. People desire to know about their relationship with the chosen environment: for instant, when they are in a large environment. Thus, this research views the human-oriented aspect as the central idea in the production of a smart, flexible wayfinding device/tool, that can communicate instantly with museum personnel or others who have a similar purpose during their visit to the museum. Activity-Centered Design is the method used in this research to examine existing problems of the wayfinding system in the NSTM; to critically analyze the tensions between the traditional system and the possible future wayfinding device/tool (the prototype of this design research) within the framework of this Activity Theory and to propose benefits this new wayfinding device might bring in terms of a new visiting experience and finally, to refer to the feedback from users to sum up the research findings and future possible developments. The results from user feedback, based on a questionnaire, an interview and prototype texting in the NSTM, indicate that most of the participants agreed that this new wayfinding device/tool was more effective in assisting them to find their location than the traditional wayfinding system (paper map, signs etc.), and that humanized interaction with the environment was a valuable tool to increase the level of visitor satisfaction.

Keywords: Information Ecology, Museum Study, Wayfinding, Digital Mobile Device, Activity-Centered Design (ACD), Activity Theory (AT), Activity Theory checklist

1. INTRODUCTION

The purpose of this research is to develop an effective wayfinding system that guides people safely and quickly when they visit a museum. This research takes the National Science and Technology Museum (NSTM, Kaohsiung City, Taiwan) as a case study that forms the context for this design research. According to Nardi and O'Day (1999), the NSTM could be regarded as an information ecology.[1] The museum has changed to a place that, while carrying out the equally important roles of education and conservation, must also ensure that people have enjoyable visiting experiences. People come to the museum with different purposes, and the wayfinding system is the first medium to connect with the people as they enter the museum. This research (See Figure 1-1) employs Activity Theory (AT)

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[1] An information ecology is a system of people, practices, values, and technologies in a particular local environment (Nardi and O'Day 1999: 49).

(Engeström 1987, 1993) and Activity Theory checklist (Means/ends, Environment, Learning/cognition/articulation and Development) (Kaptelinin, Nardi & Macaulay 1999) as a tool to explain how people use existing or future possible devices/tools to interact with the environment for reaching the anticipated result. This research will examine the existing wayfinding system of the NSTM as a problem issue, applying the concept of AT to describe how people use tools as goal finding mechanisms and to describe the tensions between the existing and future possible tools. Then, using the principle of Activity-Centered Design (ACD) as the method to analyse the problem of the existing wayfinding system, this research will then produce a humanized wayfinding system which could achieve a workable system within the concepts of human-computer-field/situation in the future.

1.1 Medium as the tool

Information exists through particular mediums. A new kind of medium produces a new type of appearance and content as well as a new experience. The medium is not merely seen as the tool, but is also regarded as a form of information itself. The medium is a mediator in order to reach the purpose of communication between the subject and the object. People exchange information; convey feelings and ideas that must rely on communication to accomplish the process. The medium is a tool that humans use to communicate with others or in other environments. However, a different tool can change the efficiency of communication in varying degrees. In order to enhance the value of education and the promotion of public relations, the museum takes the guidance system as the issue of ultimate service to its visitors. Consequently, to build up the connection with the senses of vision and hearing, as well improving the broad base of knowledge and the content, the design is much more flexible in the interaction available for the user to obtain all the required information. Society is now turning to the digital period with the gradual development of information technology. This also influences the way human communication occurs and the expressions of knowledge, and also our way of thinking. In order to build an adaptable relationship with people, the museum relies on technology to improve the functions of its educational purposes by connecting digital facilities for transferring knowledge into useful information, and by promotion of the quality of the culture in this complex society.
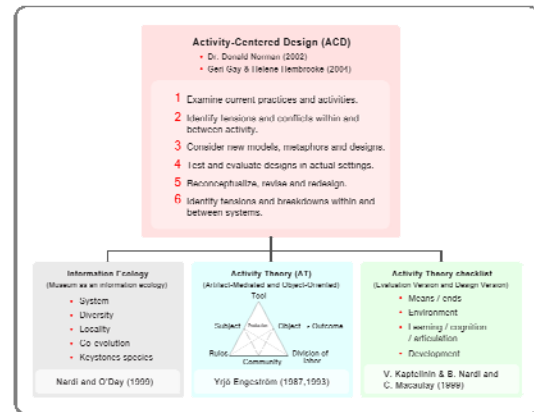
Figure 1-1. Activity-Centered Design (ACD) is the principle theory of this design research.

1.2 Wayfinding and Museum

The role of the museum has changed from the passive to become a place where there can be active interaction in accordance with people's demands. "Visit" is a life experience. People in an information filled strange environment, besides employing one's own perspective to understand the surroundings, also need to have some external information to help them orient themselves in the environment. Wayfinding is a socio-cognitive process used when people find their way in an environment. It is a representation of a combination of external information and internal behavior (Passini 1992). It occurs when people, in the process of finding the way in or outdoor environments, use the environmental information (e.g. signs, paper maps) to assist them to reach their destination. As technology has progressed, the wayfinding system in the museum has developed from the original linear style offering information through the use of tape recordings in the earlier period, to the current digital mobile device that interacts with people through its multimedia information. The museum's intention, by implementing these guidance systems, is to provide its visitors with thoughtful and challenging experiences when they visit the museum. A digital wayfinding system utilizes the latest technology to break open the limitations of space and time for the user to experience directly the diverse information provided for the educational purposes of the museum. In addition, the digital wayfinding system not only focuses on how technology is used, it also explores more functional services that may be required by the visitor.

1.3 Rational and Aim

Under the impact of the information age, the way of communication has changed rapidly and is now more concerned with integrating the

functions of the human sensory organs into the new technology. However, the application of any new technology should make people feel comfortable when using it to gain meaningful experiences and understanding when visiting any educational institution such as a museum. That is to say, the museum is a place to communicate and share experiences; it should offer an interference-free interaction to individualized demands for exploring more interesting experiences in the museum environment. Relative to other wayfinding system (e.g. fixed signs), the digital wayfinding tool is easy to carry: visual images attract people's attention, and it is like a personal guide for people visiting and learning in the museum. This system stresses the use of a non-linear visiting route, one that is based on people's individual ways of interacting with the museum, so providing the maximum enjoyable museum experience, an outcome that is the aim of the museum and is achieved through the development of the digital wayfinding tool. Hence, this research investigates how people use tools for receiving effective information to allow them to interact within the environment when they are finding a new location. At the same time it also allows a building up of social conversation/interaction with others in the museum.
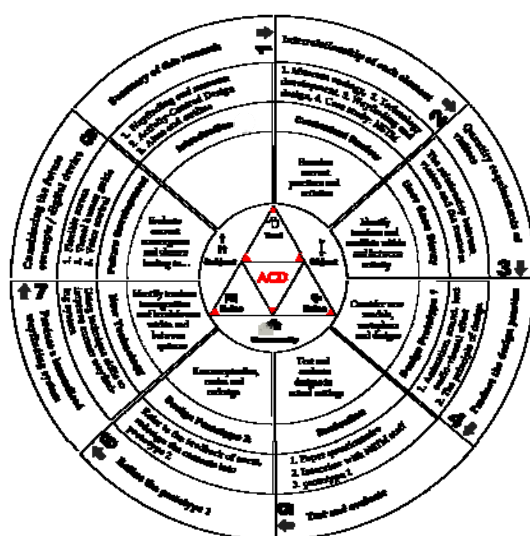

Figure 1-2. The presentation of this research structure

2. METHODLOGY

Activity-Centered Design emphasizes the relationship between the human who interacts with the tool, and who is influenced by the functions of that tool, and the physical environment. It considered the tool that people used provided benign feedback according to people's demands. Activity Theory expanded the

notions of the interaction between human behaviors, the tool and its cultural history and the environmental situation to include interaction within communities in a social context.

2.1 Activity-Centered Design

In ACD, Gay & Hembrooke (2004) proposed a new method for the traditional Human-Computer Interaction (HCI) Design [2] which did not merely pay attention to the basic research and practice of HCI, but also examined the design context and the motivation of human behaviors at the same time. Gay & Hembrooke (2004) proposed a model (see Figure 2-1) that is consistent with context-based design, describing activity as the method of teaching. This model stresses that activities are made up of actions which have a contextual character. It involves a discussion about the relevance of tools and tasks, about how activities shape the requirements of particular tools and how the application of tools begins to reshape the activities.

2.2 Activity Theory

AT is a philosophical meta-theory and cross-disciplinary theory with a naturalistic emphasis that provides a framework for examining various forms of human praxis and sets of perspectives on practice, that interlink both the individual and social levels at the same time (Hew and Cheung 2003; Jonassen and Roner-Murphy 1999). AT is an efficient socio-cultural and historical theory that focuses on a collective object-oriented activity system as its primary component of analysis (Gay and Hembrooke 2004; Jonassen and Roner-Murphy 1999; Kaptelinin 1996). Nardi (1996) regards AT as able to offer an explicit framework of describing human activities. AT theorizes that when individuals interact with their environments, production of specific tools result. These tools are obviously recognizable as the result of mental processes, and through this process these mental processes become accessible and communicable to other people,

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[2] An early study on Human-Computer Interaction was carried out by Bødker (1990). Human-Computer Interaction (HCI) is the study of interaction of knowledge between people (users) and computers. However, it carries out the study of the knowledge on both sides of a human and a machine interrelationship. On the machine side, techniques in computer graphics, operating systems, programming languages, and development environments are relevant. On the human side, communication theory, graphic and industrial design disciplines, linguistics, social sciences, cognitive psychology, and human performance are relevant. Engineering and design methods are also relevant (Kuutti 1996; Kaptelinin 1996).

thus then becoming useful and reliable for social interaction. In relation to HCI, AT proposes that human-computer interaction is not merely confined to human and computer relationships, but may also take into consideration the interface between humans and the environment (Kaptelinin 1996).

Figure 2-1. The Design Cycle (Gay & Hembrooke 2004:11)

The basic model (See Figure 2-2) of AT originally proposed the concepts of "mediation" by Vygotsky.[3] Nevertheless, as people use the tool, intending to interact with the environment to reach a particular goal, the triangular model, that is, the basic model of AT, is insufficient to prove the importance of other extra factors, for instance: relevant communities and personnel. Thus, to make an activity structure (system) that completely explains human behaviors and external factors, new elements must be added (see Figure 2-3). A new model of an activity system was conceptualized by Engeström (1987,1993): the production of any activity integrates the subject, that is, the individual or group that decides the activity as a whole. The

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[3] The cultural-historical theory of activity was developed in the 1920's and 1930's by a group of revolutionary Russian psychologists, who were determined to shift the spirit of Feuerbach's thesis into a new aspect of understanding and transforming human life attitudes. The basic conception of this theory was formulated by Lev S. Vygotsky (1896-1934) the founder of this school. Vygotsky proposed that psychology in the 1920's was oriented towards two different methods, psychoanalysis and behaviorism. Vygotsky and his colleagues, Alexamder R. Luria and Alexei. N. Leont'ev defined completely theoretical concepts of "artifact-mediated and object-oriented action" and started the use of the term "activity" to improve the situation (Kuutti 1996; Vygotsky 1978:40).

tool can be anything which is used in the transformation process; these things can belong to physical materials or abstract concepts such as a plan, idea, experience.
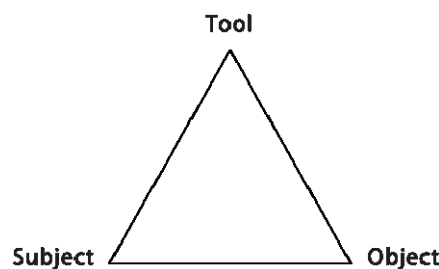
Figure 2-2. The original concepts of Activity Theory.
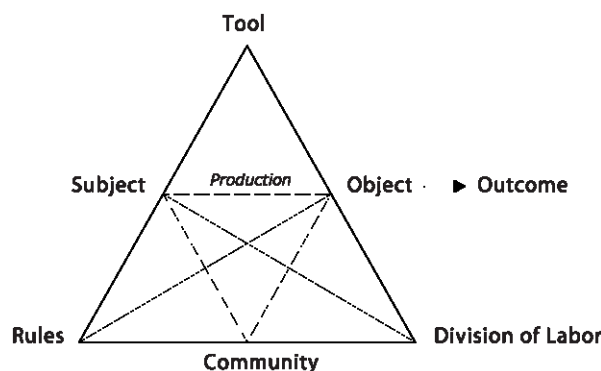
Figure 2-3. The mediating structure of Activity Theory (Engström 1987,1993)

In order to develop Vygotsky's social psychology on the action oriented theories of learning and development, Leont'ev (1978) proposed a three-level perspective (see Figure 2-4) to describe the object (the tasks), the actions, and the operations that transform the object, and relates these terms to motives, goals and the conditions. Activity produces a succession of actions through the motives; an action includes chains of detailed operations. Underneath the collective activity and individual action, there is the level of automatic operations. Operations are dependent on the conditions in which the action is performed (Leont'ev 1978: 66).

Wayfinding is a goal-oriented activity that consists of a chain of operations to present its process. In this case, I applied the concepts of the hierarchical of an activity (Motive-Conditions-Goal) to explain the process of finding the way as people use the mobile digital wayfinding device in the museum (see Figure 2-5 below).

**Figure 2-4   The hierarchical level of an
activity**
Source from:
http://informationr.net/ir/11-4/paper260.html

**Figure 2-5. The process of finding the way
with the digital wayfinding device in the
museum.**

Through the concepts of AT, relevant problems among the interaction of systems and users situation can be defined, and the theory may also assist designers to more completely understand the issues of activity, and also to link up the dynamic and mediation communication in such areas as theory and research (Rizzo and Palmonari 1998). As the theory of ACD pointed out, design practices should consider how people, through using tools, act within their environment. The user's response and behaviour will cause different results or will be influenced by the external factors/conditions. The traditional wayfinding system (e.g. paper map, fixed signboards) offers limited information and is unable to interact with the immediate physical environment (see Figure 2-6 below). T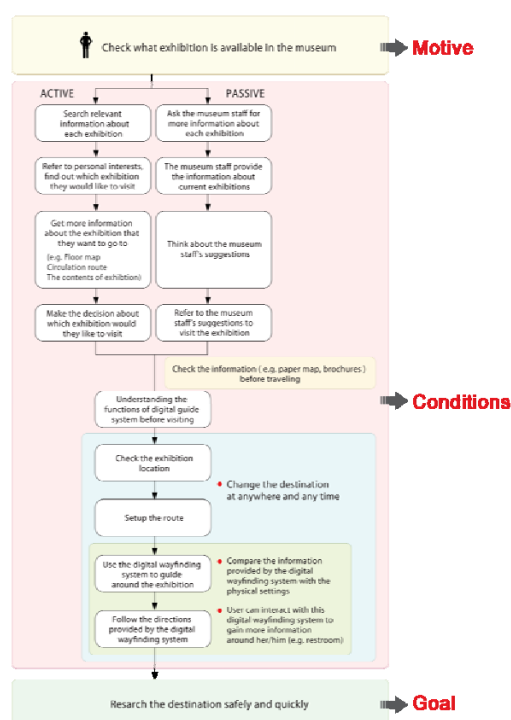he prototype developed with this research utilizes technological support (e.g. wireless network) to offer the latest information in the NSTM and enables instant sharing of the visiting experiences between relevant communities or other users.

2.3 Activity Theory checklist

Activity Theory checklist provides a clear theoretical outline of the structure of the activities that emphasize how the tool influences people's behaviour within the environment. Kaptelinin, Nardi and Macaulay (1999) suggest the four issues of means, environment, learning, and development as the focal point of analysis in ATy as embodied in their activity checklist. I have employed the checklist when analyzing the existing wayfinding system in the NSTM as part of the evaluation stage.

◆ Means / ends
The wayfinding systems currently in use at the NSTM are the static signboard, the personal guide, the handheld mobile devices (PDA) and the paper map. According to the annual reports (2005-2008) of the NSTM and the results of my questionnaire in most cases visitors are not satisfied with the wayfinding systems of the NSTM, especially the PDA devices. The existing PDA system has not explored the potential of wireless to orient visitors to their future location or in a context with other visitors.

◆ Environment
People use different wayfinding system to process several activities either individually or as a group within the different groups in the NSTM. The wayfinding system currently in use in the NSTM is structured. A paper map is a visual way to present information about the museum; the fixed sign is an important means of offering directions to help people make decisions, while computer devices (e.g. PDA, internet counter and kiosk station) inspire people's curiosity to have an interesting visiting experience. In the late twentieth century, the New Museology (Vergo 1997) emphasized humanoriented displays as the main way of improving the functional interaction between people and the environment. This does not merely take the context into account to explain how to solve any problems. It also takes into account the type of connection in the relationship between the society and museum. The NSTM may have used technology to set up efficient systems to enrich people's visiting experiences. However, it is clear relevant reviews (The annual report of NSTM,

2005-2008) that it did not pay much attention to solving the problem of people becoming disoriented.
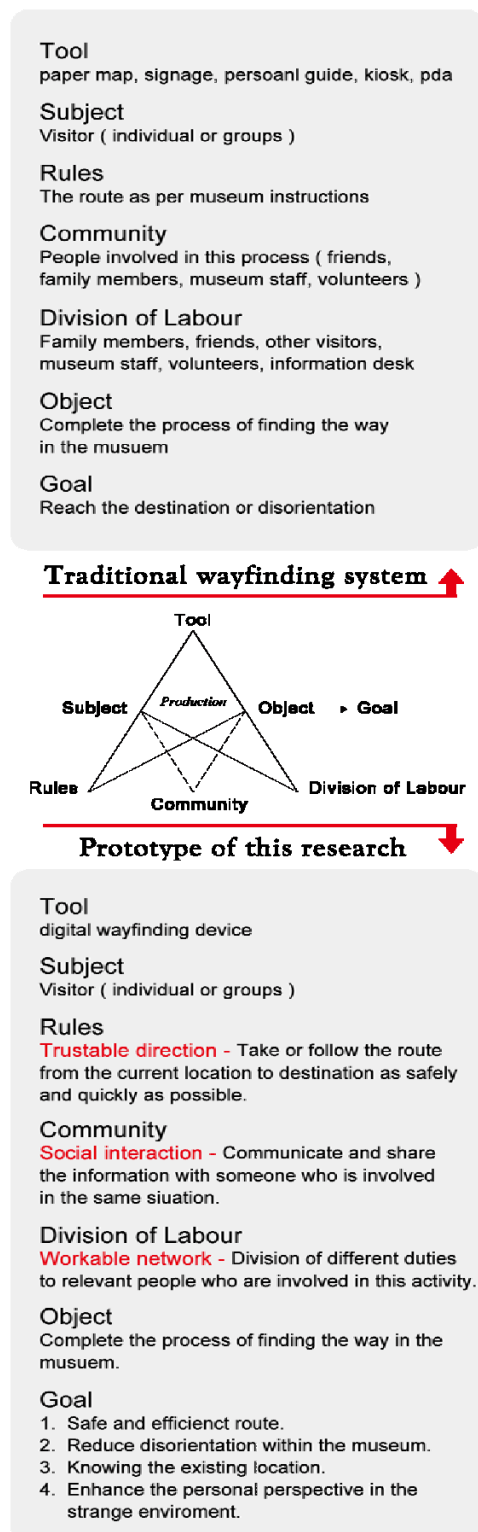
Tool
paper map, signage, persoanl guide, kiosk, pda

Subject
Visitor (individual or groups)

Rules
The route as per museum instructions

Community
People involved in this process (friends, family members, museum staff, volunteers)

Division of Labour
Family members, friends, other visitors, museum staff, volunteers, information desk

Object
Complete the process of finding the way in the musuem

Goal
Reach the destination or disorientation

Traditional wayfinding system

Tool
Production
Subject   Object   ▸ Goal
Rules   Division of Labour
Community

Prototype of this research

Tool
digital wayfinding device

Subject
Visitor (individual or groups)

Rules
Trustable direction - Take or follow the route from the current location to destination as safely and quickly as possible.

Community
Social interaction - Communicate and share the information with someone who is involved in the same siuation.

Division of Labour
Workable network - Division of different duties to relevant people who are involved in this activity.

Object
Complete the process of finding the way in the musuem.

Goal
1. Safe and efficient route.
2. Reduce disorientation within the museum.
3. Knowing the existing location.
4. Enhance the personal perspective in the strange enviroment.

Figure 2-6. This diagram uses Activity Theory to present the differences between the traditional wayfinding system and the prototype. [4]

[4] This presents the current wayfinding -

This prototype (digital wayfinding device) can offer people flexible options for personal interests (e.g. the character setting, font size etc.) and for their intended destination (this option can be changed at any time by the user) before visiting the museum. Then, within the museum environment, this system will present related graphics or text to compare with the physical world to inform the user where they are at that time, and will even give information about other exhibitions that are close to the user to allow for much more flexible activities within the museum space. In this way, the new system will provide a single method of communication with the user to prevent confusion which occurs when multiple information systems are used.

◆ Learning / cognition / articulation

When people carry out an activity, personal mental processes and external environmental factors may cause a different result from that anticipated. Environmental psychologist Passini (1992a, 1996) proposed that a "cognitive map" is not a real map, but an image which may come from a past visiting experience, or from other materials provided, for instance, a paper map.

People will use their past experiences to understand surroundings and interact with them, even if they are in a strange environment. For instance, people who have been to the museum in the past, when they go to another museum, will use their past experiences to find the relevant information (e.g. museum brochures that should be available at the museum main entrance, etc.) and might think the situation of this museum could be something the same as the past one. In general, the exhibition information or floor map is usually located in front of the escalator, beside the stairs or on the wall around or near the lift, and are the decision points for people to continue making decisions about moving ahead.

◆ Development

system/device in use in museums in general, and the new digital wayfinding device that is proposed in the prototype. The new digital wayfinding device (the prototype) could improve the existing wayfinding system in NSTM, which is deficient in terms of the information it communicates, through various technologies. The prototype can provide more interesting interactive activities, such as sharing visiting experiences with others in real time.

The fixed sign and paper map are traditional devices for assisting people to orient their location in a large indoor environment. As technology has progressed over time, in the past decade several wayfinding systems/devices have been developed, from the earlier single-sided audio tape to the digital MP3 [5] player, allowing people to no longer be confined to a set order of received messages, instead, being able to choose contents specific to their needs. Kiosk information stations and the World Wide Web (WWW) are now used in museums to provide interaction with people interested in exploring aspects of the museum and to form relationships between the museum and its visitors. A new model of wayfinding system has been developed along with the associated technologies of wireless, Bluetooth etc. For instance, the personal digital assistant (PDA) is a light handheld device that combines the visual information of paper map with the various supporting media to provide a new visiting experience for the visitor (e.g. audio, video, animation).

Technological changes will continue to transform wayfinding development. A sense-based (e.g. talking, touching) system might provide the input of a future wayfinding tool. For instance, a visual representation of a human acts as a private personal guide. Through interaction with it, disorientated visitors or questions about the museum will no longer be such a problem for people visiting the museum in the future.

As stated as above, in the case of NSTM, the subject of this research design context, the Activity Theory checklist has been applied to the existing wayfinding system and has shown why the present system is ineffective as a wayfinding system. It has also been used to explain how people use past experiences to assist/orient themselves in a new environment. Through the analysis of ACD and with the views of AT as additional support, development of the new tool (digital wayfinding device) may bring new visiting experiences that are much more effective than the traditional wayfinding system.

3. CONCLUSION

In this prototype development I used ACD as the method to develop a new digital wayfinding device that can both guide people safely to their destination, and also bring new interactive experiences to people in a more active form than in the past. The concept of the human-computer-field/situation is an extension of the model of ACD, that stresses how people use technology to interact with the physical environment and anticipates what their actual needs are.

This design concept acknowledges that people (human) are anxious about recognizing their location in the NSTM; that they then use this new digital wayfinding device as their primary tool (computer) to orient themselves in the current location and to understand what their relationship is with the environment (field/situation). Through this new digital wayfinding device people can then find the relevant facility or staff; who can share information with someone wanting to go to a similar destination, and the roles of museum staff can be divided according to the different demands. The design concept reflects the notion of AT that the "tool" used could cause different results (effective or ineffective) within the process of activity. This new wayfinding device (design prototype) was tested in NSTM in 2007, and makes reference to the participants' feedback to improve the functions in the future to more closely approach the users' requests. The questionnaire results found that the user considered the influences of design on the color choice (comfort and usability), the font type and size (readability), the simple and clear text description, and user friendly interface design. When compared with the current wayfinding system in the NSTM, the user felt that the close attention paid to the functional guiding (e.g. orient existing location in the NSTM anywhere and anytime) was the most important element that would improve the experience for the visitor of the future.

One thing we can be sure of is that technologies will change dramatically over time, and with the change, the experiences and opportunities technology offers to the user/visitor. I have sought to develop a prototype that uses currently available mobile technologies in a new and more creative way.

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[5] MPEG-1 Audio Layer 3, more commonly referred to as MP3, is a digital audio encoding format using a form of lossy data compression. It is a common audio format for consumer audio storage, as well as a de facto standard of encoding for the transfer and playback of music on digital audio players. (Source: http://en.wikipedia.org/wiki/Mp3, received on15 March 2006)

Figure 2-7. Frames of the two language versions of the final prototype.

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Multimedia Semiotics of Two Works of Art - Lin Pey Chwen, Clemencia Echeverri Cultural Accents, Natives and Digital Immigrants

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ABSTRACT

This paper proposes the investigation of two Multimedia works of art, intending to give an answer to the possibility of the existence of a disparity between art devising or art reception, performed by the community conformed by digital immigrant and native community. In order to respond to this issue, this paper proposes to take into account the narratives and Multimedia engineering of two artists: Lin Pey Chwen (Taiwan) and Clemencia Echeverri (Colombia). The method employed in this research is the study of two Multimedia works of art by the cited artists: "Play" (by Lin Pey Chwen, performed in collaboration with the Digital Art Lab, University of Taiwan) and "Heritage Games" (by Clemencia Echeverri), in order to analyze the semantic narratives of their art proposals; their art criteria and the way both artist devise trough technology a complex semantic field, that is here proposes, that is meant to be read between the lines . It is also taken into account New Technologies for Information and Communication Technology (ICT) as means which led to a social turn, in general, and a new Art paradigm in particular, and also gave wary to the emergence of a new Image criteria. These newness of consequently built as well a new, refreshing and complex aesthetic field, which has assumed by means of ICT and New Technologies (NT) the arousal of a new Image criteria, understood as data.

The cited works of art – "Play and "Heritage Games – were chosen considering their authors as digital immigrants. In order to analyze the impact of their belonging to the immigrant category, it seems relevant to consider that the narratives they propose in these and other pieces of their body of art work, have been devised through technology, in order to highlight an intentional semantic field. At the same time, it is intended to understand how their work might be received or understood by digital native community.

In order to offer a scenario for the arrival of a new digital art paradigm, as the one embraced by the cited artists, a minimal taxonomy of digital art is sketched, as a computer art archeology. It is also taken into consideration that Art will be understood in this paper as a "social artifact" , engaged to its time and social background. As to comprehend the arrival of Multimedia art proposals, a brief taxonomy of Modern Eastern Art will be considered, along with so called "crisis of representation" of analogical art, which foregrounds the first digital art works. Multimedia "Play" and "Heritage Games" are here analyzed as a medium between artist and spectator, and also as a way to think, perform and exhibit a work of art. It is also taken into account , when analyzing these works of art, that there are several coincidences that might be found, which enables us to establish a parallel between both works. As a result we find that they may be considered a synonym of "semiotic technology", and also concur in being devised, designed and exhibited trough New Technologies. We propose that these works of art have performed techné as mediator of poiesis. There is also a parallel between their narratives, both referring to local rites, proposed from a critical point of view, seeking re-signification and repair. We finally suggest that these artists and their body of art work, prioritize anthropological issues, over technical instrumental practices, certainly needed in order to devise their narratives.

This paper concludes with the idea that, considering the existence of two digital communities, there might be

a different corpus of ideas, between digital natives and digital immigrants and we may also find a difference in the way to devise their works of art, and their way of acting and reacting in front of a Multimedia. It is impossible to generalize, but it is however possible to conclude that digital natives might underline the engineering of a Multimedia piece of art, meanwhile digital immigrants – who have also embraced these art language – might highlight art narratives from a perspective, where emphasis is put on technology as a cultural and anthropological value. As a final conclusion for this essay we say, along with Baudrillard that "in the heart of video cultures there may be a screen but not necessarily a regard".

Keywords: Lin Pey Chwen, Clemencia Echeverri, Multimedia, Contemporary Art

1. INTRODUCTION

This paper proposes the approach to two Multimedia works of art. It also intends to understand if it is possible to gaze a gap between native and immigrants digital creators/ spectators of a Multimedia piece of art, considering that there is a digital citizenship conformed by these two communities.

We understand that, given the diversity of approaches that coined the concept of art trough history and different cultures, it is important to clarify what we propose as art concept: a device created by an individual artist or group, in order to establish an aesthetic link with a spectator.

We propose New Information and Communication Technologies (ICT) as means that enable the arise of a new paradigm, which also managed to build a new aesthetic field, consequently impacting on art creation and realization, assuming that ICT and New Technologies (NT) makes possible a new Image criteria.

Andrada (2010 p.139) defines New Technologies as "electronic-based developments that have gone through in recent decades, impacting all areas of human activity." i The category of "digital natives" was created by Prensky (2001) in his article "Digital Natives, Digital Immigrants, a new way to look at ourselves and our kinds" ii referring to people born in the electronic age. Therefore, adults born in pre digital age are defined as immigrants.

We will refer to Prensky's category in order to seek a turn in the way digital natives and immigrants create and produce their art work. As a subject allowing us to understand their digital citizenship's approach to art, we choose two well experienced artists in this particular field, and select two Multimedia pieces by these artists: "Play" by Lyn Pey Chewn (Taiwan) and "Heritage Games" by Clemencia Echeverri (Colombia). It is our intention to analyze in these Multimedia, what was pointed by Gubern (1996) as "iconological fields", and in that direction we propose to find those fields as we *read* these works of art, performed by New Technologies. These two artists are here considered as digital

immigrants and are taken into account out of their body of technological art and particularly out of their singular way of working on meaningful fields and narratives, which are thought, produced and exhibited *trough* technology and *because* of technology. We also intend to analyze if their digital immigrant status condition is actually present in the narratives and semantic fields of their works. At the same time, we propose to understand how their work is considered and understood by natives. These cited art works were chosen in the context of the theoretical proposals of both artists, also considering a reference to their works by art critics and philosophers and we shall finally take into account other art proposals within the Multimedia discipline, performed by the selected artists.

I

1. Immigrants and Digital Natives. A question of "accent".

As we are here considering an issue as "digital citizenship", we need to expose what is understood by this subjective term: natives are people who are born in the ICT society, where they are supposed to have built their criteria, considering that ICT had influenced upon them in a particular way. We share Virilio's warning about globalization and connectivity, understanding that in the so called map of global integration to ICT, there are communities who are actually foreigners, and excluded of any digital citizenship. Once having pointed this issue, we now say, along with Prensky, that immigrants may bear an "accent" in their "speech" (in processing thinking and actions), which is different from what we shall call *native's dialect*. It is here proposed that immigrants – immigrants who are familiar to Western educational practices – are integrating themselves to digital citizenship after having been educated within the "Guttenberg era", within the printed book paradigm, which enabled a linear construction of thinking. These immigrants community, as art creators, have experienced their work on or with analogical

supports and materials. They traversed important years of their lives outside the ICT culture. When producing art, immigrants have been familiar to analogue art disciplines such as painting, drawing, sculpture and engraving, and have exhibited their work on tangible isometric supports. The immigrant art producer has move, whether with joy or disgust, to a new social consolidated paradigm, which also shows a threshold to a new art field.

On the contrary it is here understood that digital natives are born when ICT are already developed and legitimized as a defining identity of contemporary times. Digital native's lives would be then, traversed by the use of virtual environments, personal electronic devices and instant connectivity. We then consider that dealing with virtuality may have imprinted on natives a multimodal way of thinking, which consequently would enable them to perform actions, criteria, and furthermore, understanding "reality" with their own singular criterion developing their own aptitudes, which are considered in this paper as their dialect. We understand that the daily contact with virtual reality, interaction, proximity, connectivity phenomena, would imprint on their thinking and actions, singular manners of instrumental construction of "meaning", consequently distinguishing digital native from digital immigrants, although sharing the same citizenship. "The appropriation of ICT promotes citizens a sense of mutation, innovation, change, evolution, development, crisis, renewal and reform" iii (Andrada 2010:140), these digital natives' attitudes and skills have been extensively analyzed by experts in the field of education who have concluded that it is necessary to rethink practices and ideas for this new social subject. Dussel (2010), refers to digital natives' abilities and their multimodal way of thinking, he also understands that "Kids today can use simulation games and manipulate media content, opt for multi-tasking, and understand that knowledge may be constructed in a way that provides them the possibility of performing different tasks at a same time, and move from a film to a book or videogame, with astonishing easiness." IV According to these ideas, this paper intends to consider that the digital natives' practices of ICT, enable them to construct new ways of thinking and performances, which have already developed a new social paradigm, and consequently, a new regard towards art devised by New Technologies.

At the same time, Gubern (1996 a: 27) understands that what historically remains as permanent in the Image concept is its meaning, and warns about what *meaning* actually is: a field with "varied significance, so varied that they may be indecipherable to subjects belonging to different cultures." We believe that the works of art built by the use of New Technologies might be undecipherable for "foreigners" to digital citizenship. We also propose that even sharing a same "digital culture" there might be a measurable distance between natives, immigrants and foreigners, when thinking and performing art criteria. Therefore, we here propose that practices developed with the imprint of digital native's dialect would process one singular type of "art narratives" with its accent on technical instrumental devices, when performing their New Technology art products. In consequence digital natives might also have become a new type of art receptor.

II
A POSSIBLE DIGITAL ART ARCHAEOLOGY
1. Digital Archaeology. From tangible art surfaces, to image as data.

Gubern (1987) refers to the hominid who, viewing his reflection in the surface of a lake, first recognized himself as a subject. This author refers to this singular moment as "stellar". Gubern's idea of self awareness was inspired by Lacan's notion of a mirror stage.

This "stellar moment" is then meant to be the engine of an "iconic impulse" which would lead to the sketching of the first iconic image, considered as the origin of art. From its beginnings in pre-corporate cultures, the iconic image would be executed on various surfaces and done with various tools, for also different purposes. Gubern (1996 b: 21) proposes as a singular attribute of mankind, the iconic "human visual appetite." iv . He also believes that "the iconic image is a perceptual and cognitive category, a representational category, which provides information about perception of the world, perception that is differently coded by each culture" (...) and understands that there is "a particular art dialect for each human culture" v This paper does not intend to draw a taxonomy of different cultural art dialects - diachronically understood - but intends to take into consideration digital natives' dialect and digital immigrants' dialect, in relation to creation and interaction of a Multimedia piece of art.

We will now try to point out some purposes that have followed men as performing art in different cultural dialects. The iconic image is understood by Gubern as a "social artifact" vi, following his idea we may say that each culture, in any time, would imprint its work of art with a singular meaning and purpose. Art has been considered for certain dialects, a magical intermediary, a mediator between human weakness and Nature

forces or God's will. Meanwhile, Modern Europe developed a new approach to art – which was extended by European hegemonic power over its colonies, as an Eurocentric art view - understanding art criterion as an iconic secular image, neither religious nor utilitarian, expressed by a representational system, capable of reproducing (in act of *mimesis*) a iconic image identical to the phenomenological model, a duplicate of what is perceived by means of the eye and then structured by the brain. In opposing this paradigm, Modern Europe contemporary cultures share a different vision of art, and understands painting, sculpture or whatever objects are done with an aesthetic purpose, as imaginary creations, submitted to the standards imposed by religious or sovereign's requiring.

Western European culture has built in Eastern Cultures an hegemonic idea of art, understood as a synonym of a tangible object created to be contemplated in order to provide delight to an spectator. "Art" (Modern, Western and European) is also supposed to bear no useful purpose. If so, it shall be condemned to be labeled as "minor art". This biased point of view is still admitted today in Western culture, reducing art universe to limited terms, yet and still legitimized. This simplification of aesthetic diversity of art languages and dialects limits the diversity of art phenomenon to be understood as an image created on a surface or a three dimensional volume, with the purpose of delighting bourgeois taste and to be admired, hanging on a wall or as an sculpture "on its pedestal".

Within the first decades of the twentieth century, Modernism and the avant-garde movements of Western art (time when "isms" are developed) put an end to five hundred years-a vision of art claimed as mimesis. The avant-garde movements (the so called "isms") would recognize visual elements as being able to be independent from reality, unrelated to the classical art mirror mission. Although art had become abstract, there is still a continuity with the paradigm established by Modernity. Western art is along those years , no matter what is painted or shaped, understood as an image created on a surface or being a three dimensional form, an artifact created to be contemplated and still. Avant-garde movements actually performed a turn of the syntax of the art work, but we propose this change as mere cosmetic, and unbound a paradigm shift.

As sketching this minimal archeology of digital art, we propose that during the decades of Western Modernism, we may find some significant pieces of artwork, examples of germinal intentions to build a new art paradigm. Paradigm which we understand arouse with the arrival of digital image. Mexican poet and writer, Octavio Paz (1998) refers to the work of Pablo

Picasso and Marcel Duchamp, and quotes that Picasso's paintings are images, and Duchamp's are a way to think about the meaning of an image. He refers to Duchamp's ready- made as a "not smelling art" vii, as Duchamp did not use oil paint neither painted or modeled his art proposals. Paz also believes that this artist highlighted the uselessness of manufacturing art as creating his already made works of art. Paz criterion on Duchamp's work may now serve as an adjective to certain properties of the digital image. Duchamp's early rupture with art representative tradition - when proposing his "Bicycle Wheel" viii(1913) as a work of art - might be understood as the first sign of discomfort with former modernist art. We propose that in the sixties, modernism was already exhausted as a novelty within the avant-garde movement, and in consequence, a "representational crisis" arose.

We propose The "Bicycle Wheel", even analogical, as a precedent of a new art paradigm, believing that it might coincide with some of the items that build the status of digital art. Duchamp's intention to put an end to the "uniqueness" of a work of art, for several versions of the same piece were produced by the artist and neither was the "original". Duchamp's "Bicycle" also questions the representational historical system, as it brings up the idea that re-presenting (iconic representation) could be substituted by supplanting the iconic re-presentation, for everyday objects already manufactured (ready-made), which could be used to devise a work of art. He and History have legitimized his criteria, as Art . The first decades of the twentieth century were years of different art dialects. We then propose that avant -garde movements were already exhausted in the sixties. Weibel (2004), in his seminar named" Art algorithmic. From Cézanne to the computer" argues that "the sixties forced a radical revision of the conditions and conventions of society and European history ", at the same time Danto (2003) refers to those years as" ix a time that much of what was considered integral to the concept of art, simply disappeared from the art map. Not just beauty or mimesis: almost everything that had occupied a place of relief in the life of art was removed by the roots, and he points: "A crisis seams to fall on the Western avant-garde movement "x.

Nevertheless, during the same years, new art proposals might be observed, showing the intention to deconstruct the idea of art as a synonym of a tangible, static and isomorphic artifact. Mechanical movement is imposed to sculpture. Projected light on a wall or space starts to be considered as a new art language. The newness of these art experiences

legitimatize the work of art as a non tangible device. We understand that these innovations could be considered signs of a paradigm shift. We propose to consider the actual art status turn with the arrival of the possibility of constructing images with the concur of mathematics, with a binary system enabling the creation of bitmaps as digital images. This new image criteria, is *data*, information. Concerning the upcoming of digital image, we do not attend to a cosmetic dialectal change, but to the arrival of a new language, a new way of understanding Image: it consequently moves from being an analogical artifact, to the new status of image as data.

In the sixties we also attend to the arousal of the first experiences of computer graphics xi and the trace of a germinal digital art criterion. The experimental primary digital aesthetics xii are produced during the critical "crisis of representation." With the expansion of the New Technologies and a new image criterion, we may "save" images as data in a minimum material gadget: the tangible device which stores information and that is not certainly the aesthetic device itself. Digital image is created to be multiplied by different canals, viewed in different sizes, with diverse qualities, and as data, globally shared by technological procedures and technologies. Digital image upraises a new image paradigm consequently impacting on art creation.

II
TWO MULTIMEDIA WORKS.
"TECHNOLOGICAL SEMIOTICS"

1. Two artists, Lin Pey Chwen and Clemencia Echeverri.

It is here proposed to study the work of art of two artists belonging to different cultures, such as Asian and American (Taiwan and Colombia). It is actually risky to generalize the profile of these or any particular artist, considering their lives and art subjectivities. They have been chosen, however, taking into account that their particularities will help to identify what we here intend to highlight. As the purpose of this paper is to refer to native and immigrants citizens, we propose to consider these two artists as integrating the immigrant community, sharing a digital citizenship, and being impacted by ICT, bearing nevertheless an immigrant "accent" in their art language. These two artists propose works of art devised with New Technologies. We assume the risk of considering a parallel between their Multimedia, because we find in both works of art a common language and accent that may be referred to as "semiotics technology". We assume that cited artists are creators of art pieces which are possible, only out of the existence of technologies. We also mean that their narrative

proposals and semantic the fields of their art works are linked to philosophical and cultural issues. We certainly believe that, despite the uniqueness of any personal story, the narratives of these artists might concur in exposing a critical panorama of the human condition, society and gender issues. Both works of art selected in this paper, then share the same focusing on society, myths, traditions, and beliefs.

1.2 The Selected Works of art are "Play" (2007-Taiwan) by Lin Pey Chwen, performed with members of the Taiwan University Digital Art Lab and "Heritage Games" (2009/2010-Colombia) by Clemencia Echeverri. As a frame work to contextualize their art *corpus* we here consider their personal profiles, art critics and philosophical references to their work. Both artists have also been interviewed, so as to confirm criteria about them.

Proposed matches between artists and the selected Multimedia pieces:

a-Both works are digital Multimedia / Video Installation, devised by technology and both works of art are understood as a synonym of "semiotic technology."

b-The works selected might concur in being devised, designed and exhibited with New Technologies, understood as *techné* as mediator of *poiesis*. Both artists might prioritize technology anthropological issues, over technical instrumental practices.

c- They both refer to local rites which are proposed in their works with a critical point of view, seeking re-signification and repair.

d- As an oxymoron, their works evoke the past, carried out nevertheless, by New Technologies.

e-The titles of both works include the word "game", that we assume bears an ironical twist.

f-Both artists were trained in foreign Academic forums: Lin Pey Chwen, is graduated in Australia and USA, meanwhile Clemencia Echeverri, is graduated in England. Both artist have post graduated studies in their native countries.

G-"Play" and "Heritage Games" might be considered "spoken" with the digital immigrant "accent" proposed in this paper.

PLAY

1.1. "Play". Interactive Multimedia.
Author: Lin Pey Chwen with Taiwan National University Digital Art Lab, collective integrated by Chen Jyun Yu, Lee Chih-Min, Tsai Chi-Wei, Lee Pei-Ling, Wu Yein-Zu, and Chen Wei-Kung. Origin: Taiwán. Año: 2007. Exhibited in Shangai Internacional Arts Festival, Taipei International Digital Art Festival (2007) and 404 Post Electronic Art Festival Festival – Trieste, Italia (2008).

"Art statement: The work, attempting to discuss the phenomenon how the Terra Cotta Soldiers are being manipulated by commercialism with a humorous take, has thus put the Terra Cotta Soldiers center stage in a Western theatre setting that not only aim to highlight the conflicting nature of the Westerns and Eastern cultures, but also to ridicule the ludicrousness of putting the Terra Cotta Soldiers on show like actors. The work not only attempts to highlight the aesthetics of the contemporary artistic digital games, but also attempts to reflect the significance of artificial life that technology has embodied virtual figures.

The work – "Play" has devised three distinctive virtual Terra Cotta Soldier's figurine imagery by utilizing the computer 3D animation software, which is converted into digital interactive control interface, as inspired by the Chinese traditional puppetry, together with utilizing the Virtools program, Arduino electronic circuit board, WiiRemote, to manipulate the Terra Cotta Soldiers' movement".

In the photograph below we can see spectators interacting with "Play" .

The Multimedia was recorded when it was interacted by the audience. The video was posted in:

http://www.youtube.com/watch?v=opOTdm2eN 7U (access: August 2010). In the video we may attend both to the attitudes, actions and reactions of spectators, and the figurines projected in front of the spectator.

"Play": photograph provided by Lin Pey Chwen.

1.3. Analysis.

This Multimedia assumes in English language the name "Play". Translated to Spanish - the original language of this paper – play is a synonym of "game"; "turn on a device"; "execute a musical instrument". The three denotations of the title invite the spectator to operate, to *play* with "Play" and put it in action, to play "with" the art device. The photograph above, shows the behavior of young spectators as confronting "Play". They might be considered as Eastern digital natives, acting and interacting with the interfaces which are proposed to them

by the authors. We understand that digital natives would give an enthusiastic respond to the art proposal, assuming an active performance and disposing themselves to use the interfaces, to act and perceive the simultaneous and immediate reaction of the vicar images in front of them. The native spectator would also respond to "Play", playing, turning on the work of art, and exhibiting its skill in commanding the interfaces, in order to imprint movement on the projected images of the Soldiers. The warriors are viewed inside a western theatre. These warriors are digital images whose movements and animation are possible due to the *ad hoc* software devised by the artists. They are seen "inside" a Westerns theatre stage, virtual as well. These soldiers will then act as a response to the actions operated on the commands, handled by the spectator/generator. Without the impulse operated on the interfaces commands, the warriors cannot move. All puppets stay still until a human hand – trough a set of threads, allows the figurine movements – and like puppets these virtual images are also moved by virtual and analogical threads devised by the authors. This resemblance between "Play" and puppetry tradition was intentionally devised by the team, as it is expressed in the "art statement" (v. supra p: 8). "Play" has proposed the similarity between the virtual images of the warriors and the passive puppetry figurines, in order to highlight ironically, a human power which seams to impress action on the Soldiers. Consequently, the historical and powerful resemblance of the original Terra Cotta Soldiers, guard of the Chinese Emperor, is reduced to the ludicrousness of a game offered to the spectator.

We propose that there is also a close relationship between the way these spectators interact with the images, and the videogame sets, because they show the user a fake power on the digital images, when they have actually limited to a software. We shall consider however, that who acts in front of a videogame must be called *user*, meanwhile who interacts with an art proposal, must be considered an spectator, because it is necessary to remark the distance between an industrial entertainment product and an art devise with an aesthetic purpose. On one hand there is a commercial product, and in the other hand a cultural anthropological proposal of a so called "game", named "Play". We then suggest that digital native's community, when acting and interacting with a Multimedia might experience art in relationship with their former practice in videogame technological fields. Skills developed in entertainment are actually translated to art practices as an instrumental experience. The relationship between "Play" and a videogame, as pointed above, has been

certainly premeditated by the authors. They have proposed - in order to avoid the resemblance between the traditional computer or TV screen, or computer screen, support of traditional videogames set – Play's vicar Soldiers are devised instead, to be projected in a magnified sized image. As engineering at the same time the semiotic technology of this art work, the authors propose interfaces far from traditional formats. The projected images (the Soldiers) are driven by also vicar threads, quoting Chinese puppetry tradition, as pointed by the artist's statement (*v.supra*). This work of Multimedia art invites the spectator to act, but at the same time who wants to do so, must look for the commands within the space of the Installation, which are "hidden" inside bamboo canes shaped forms, along whit everything that is a part of "Play", has the iconic language of Chinese culture. These singular commands take the place of technological morphologies.

We may then attend to digital native's community spontaneous acting and interacting with "Play", and at the same time wondering about the engineering of this piece of art. Meanwhile it might be observed that digital immigrant's community might perform a different behavior when facing "Play": in the first place we observe a thoughtful attitude questioning about the semantic field proposed by the authors, and only then, they grab the material devices disposed to interact with the work of art, in order to command the images, nevertheless once they have "played", the immigrant might highlight semiotic criteria to technological field.

It is proposed that, from the digital immigrant condition point of view, the meaning of "Play" stands on a triad comprised of: the projected warriors' virtual images, the set of interfaces offered to the spectators, and finally, as a sign to be also interpreted as part of the semantic field provided by the installation, the actions and reactions of the spectator/generator. Then, from an immigrant condition, the spectacle of the spectator interacting with the projections might also integrate the significance field proposed by Lin Pey Chwen – an immigrant herself – attending to see humans acting as puppet-players, pretending (or acting as) if they actually conducted the sacred national memoir represented by the historical Soldiers. On the contrary we believe that digital native's community - who have been impacted by ICT in the process of building their reality criterion, might highlight technology itself, acting immediately, taking the interfaces in their hands, deftly commanding the threads which connect the interfaces to the system, and enables to generate the vicar warriors' actions. Natives might draw their attention to the interfaces and

the skill they may show in front of the other "commanders" as the principal instance of the devised semantic field and considering the projected images as a substitute of the videogame screen, finally excluding them as a part of the semantic complex. Natives might probably not share the immigrant's intention to read between the lines of the art proposal, as they do not practice hermeneutical interpretations . Their community dialect induces the native to act and wait for an immediate reaction. It is certainly not proposed by this paper to evaluate these community criteria or attitudes, prioritizing one conduct or appreciation over the other one. Natives' or immigrant's criterions must be identified as a part of a singular dialect baggage of each member of a digital citizenship. Digital native's community was educated in perceiving and understanding images by new means, supports and practices. They are then capable of performing new behaviors which might have been yet, not sufficiently considered or valuated.

1.4. From technological support to semantic field.

"Play" is devised by the use of a set of technologies: 3D simulation software in order to create the illusion that the spectator is attending to a theater where three Soldiers are on stage. The projected images are a replica of the historical Emperor Terracotta Soldiers Guard. A motion sensor software translates the physical movements which the spectator performs on the interfaces to digital code, so that the Warriors are played and moved, due to the skill of each spectator, fighting between them trough the combat of the Warriors . As it was allready said, remote controls do not assume the traditional morphology of a technological devise, such as joysticks, mouse keyboard or tactile screen. Commands are hidden, and as a part of the art proposal and there is no iconic sign within the Installation of any digital engineering.

"Play": photograph provided by Lin Pey Chwen.

As can be seen in the photograph above, the hidden remotes, assuming the shape of decorated cylinders with a Chinese cultural accent, are connected to a set of threads linked to a set of points demarcated by brass studs, pretending that these physical connections actually move the Soldiers - as all puppets are performed - when the images and virtual threads integrate the digital system. We understand that the strategy of the Installation is to provide the illusion that the physical threads, linked to the remotes, do actually move the images, as they do in the analogical puppetry tradition, when in fact the spectator's/generator's movement is devised to be translated from physical impulses to digital language. The semiotic field proposal which was devised for "Play", is to pretend that the complex is analogical, when the piece of art is devised with a sophisticated digital engineering, integrating a system. It is consequently necessary to highlight the detailed net and thoughtful semiotic proposition of "Play".

We presume that digital native's community might not *need* to *read* the semiotic code proposed by Lin Pey Chwen in this work of art, and on the contrary, emphasize the instrumental devise of this proposal.

We do not intend to say that this community is unaware of the cultural significance of the work. On the contrary, we propose that due to their dialect they would highlight as an instance of the narrative the instrumental procedure, the prowess electronic devise of "Play". The photograph above shows "Play" in action.

Photograph provided by Lin Pey Chwen.

We may also observe from one side, the binomial conformed by the Warriors and the Western theatre (as digital images) and on the other side the human "puppet players" (the spectators interacting with the system) This art proposal therefore procures the illusion that the skill of the spectator may in fact command all the possible movements when - as in any software of this kind - all possibilities have been already foreseen and programmed. The illusion

that only the spectator's skill in the interaction with the Soldiers is what actually allows the digital figures to overcome the opponent is only partially true, for the movements in a system like this are scheduled, and the "puppet player" cannot perform what has not been digitally programmed. As understanding Lin Pey Chwen's though we may understand that her intention was to communicate that Men cannot do what has not been foreseen by God. According to Darley (2002) the freedom of the user – the author does not refer to art but videogames – is not only determined by the actual guidelines of the player but by the creators of the software.

As considering the attitude of either spectators, we suggest that digital immigrants have been trained in the pre-digital times to act as passive contemplators of analog and static works of art, and they might consequently be not so utterly prepared to experience an interactive Multimedia work of art, where action is requested. Therefore this community might tend to seek the significance of the work of art in the exercise of a hermeneutic interpretation, either *below* or *within* the surface of the work, assuming that the *gnosis* capital of the immigrant status is a *sine qua non* of the immigrant spectator, responding to the "accent" of his dialect. From one hand we conclude that the immigrant community might attend to the art devise "Play" understanding its narrative as an entirety which would include the spectator/action generator, and on the other hand we propose that native's community would spontaneously handle the commands – probably no wondering about their morphology - and move the threads to confront skills with others spectators or action generators, assuming the "game" as inherited by their community dialect, and translating to the exhibition room their "citizenship" conducts. Therefore we believe that digital natives are not trained for interpretative exegesis. In consequence there would not be a *behind* neither an *inside* the surface of the art work. Natives are pragmatic; this community acts, far from wondering about the whys and the wherefores. This seems to be their dialectal condition, as active members of ICT Society.

We understand that it is necessary to consider that it would be reductionism to consider that all digital natives would read the same signification field in this or any other work of art. Gubern also lets us know that "re-cognizing presumes a knowledge capital based on the subject experience", and in consequence in this particular Multimedia, whoever is stranger to Chinese culture and ignore the meaning of the Terra Cotta Soldiers might not so clearly be able

to read the irony and re- signification of this Multimedia work of art.

1.5 Lin Pey Chwen

Lin Pey Chwen and the Digital Art Lab team have created an electronic textile , an "electronic semiotics "xiii piece, referring to past and present, analogy and virtuality opposition. "Play" highlights the past, and its narrative is nevertheless – out of a thoughtful decision of her author - devised on the contrary by an interactive digital system.

We can read about Lin Pey Chwen's work of art: "In 1999, the catastrophic earthquake of September 21st and the guidance of her spiritual mentor Prophet Elijah Hong, have led Lin to dedicate her creativity to a new subject "Back to Nature" series. This series reveal the technology-driven civilization and the abnormality of artificial creatures by mocking men's folly in their desire to play the role as the Creator through the use of technological semiotics, digital images and interactive interfaces"   (see http://ma.ntua.edu.tw/labs/dalab/director-cv-en). Confronting these words with Lin Pey Chwen's art proposals from then on, we attend to a set of digital art work devised with a complex digital engineering, and at the same time expressing a narrative related to the collapse of the natural, pitting nature with an artificial instrument as technology. This idea is actually a literature Oxymoron, a paradox. We believe that this body of ideas is possible, because Lin Pey Chwen belongs to the immigrant community and is able to perform a design process, where technology challenges technology.

IV

"HERITAGE GAMES".

1.1 Multimedia -Video Installation

Technical data: Multi- channel construction divided onto eight screens; four screens in front of four others. Video images are then able to open fractions of the sequences at a same time. On the floor a ninth video image, – rounded shape – is projected. Sound field: Dolby 5.1 distributed with three audio canals in one side, one on the other, and the subwofer on a side of the exhibition room. Autor : Clemencia Echeverri. (Colombia). Assistants: Nicolás Guarín, Andrés Guzmán, Diego León, Camilo Echeverri, Daniel Prieto, Víctor Garcésxiv. Year: 2008/2011.

"Heritage Games" was presented as a work in progress in the "IX Festival de la Imagen", Manizales, Colombia (2010) organized by Colombian National University of Caldas. It is programmed to be exhibited in Galería Alonso Garcés. Bogotá on April 2011.

"Heritage Games". Photograph provided by Clemencia Echeverri.

Register of the action: The so called "Party of the rooster" is a ritual that is performed annually in the Pacific coast, in the Colombian Valle del Chocó. The artist is present in the ceremony and in the sacrifice field where a rooster is killed. She attends the ceremony / game / ritual, and captures - with audio sensors, video and photography - the humiliation that the victim (the rooster) will be subjected to .The animal will be buried with his head pocking out of the ground, then tortured and finally slaughtered as a communal manhood ritual. The artist captures the members of the community gestures and actions and, focuses her camera on the "machete", prepared for the sacrifice. This spectacle is performed in the coast, by the magnificence of the Pacific Ocean. When the moment of the ceremony begins, Echeverri starts the process of devising her Video Installation.


Photograph of the vicar ceremony. Photograph provided by Clemencia Echeverri.

Recording of a vicar performance: The artist and her team return to the site of the sacrifice, in order to record Video scenes and taking photographs of a performance which reproduces the original ceremony, starred by members of the community who perform sequences of the" Party of the rooster ", as a second issue of the ritual; then the artist records and photographs sequences directed by her. The performers are members of the same community.

Devising the Project: Once image and sound have been captured, Echeverri starts a process

which she calls "unfolding" the rite, where she "cracks" the linear narrative of the original recorded scenes and develops independent micro-narratives. It is inside the ritual where she finds the ideas that will complete the set of procedures and images that will become "Heritage Games". She then devises the syntaxes of her work of art, the space strategies and technologies that she will use and provide the spectator, in order to a delineate a signification field and a new narrative. The one created by her to become a Video Installation. As in other pieces of her art work, sound is as important as the iconological field. When coming back to the ritual scenario with the purpose of recording the performance of the "feast of the rooster", she actually composes a new event – a simulation of the original scenes that will substitute the actual performing of the ritual - as a vicar performance, conceived to avoid braking in the original ceremony, and also in order to create a new set of still images which will become segments of her new art language, within the Video Installation discipline. As in other works of art done by this artist, sound devising is highlighted as an important iconic sign.

"Heritage Games" is at a same time a registration of an action, and an acting of a vicar performance that replaces the original ritual performed every year in Valle del Chocó. There is a trace of the eye and the mind of a journalistic documentation in the act of recording the rite; however whatever is captured by her cameras is done with the perspective of an artist.
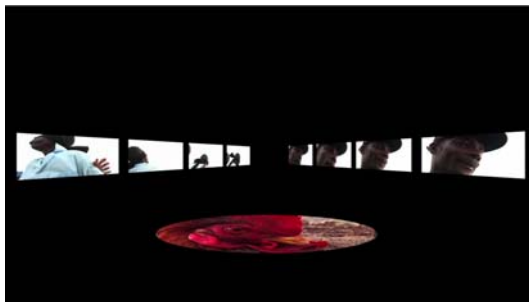
Photograph provided by Clemencia Echeverri.

The Installation: "Heritage games" is devised as a multi-channel construction, allowing opening fractions of the original image of a singular culture. Sequences are selected and divided as to be projected on nine screens simultaneously and shown on two walls in a darkened room, one of them is conceived to be projected on the floor. The Installation is surrounded by the edited sound, becoming a three dimensional experience. Once inside the Installation the spectator cannot modify the device, this work of art is not proposed to be interactive. The circular shaped image projected on the floor focuses the drama which is translated to the exhibition room. The micro-narratives emitted by the screens are the result of a careful and accurate image selection and editing process.

1.2. Image and sound construction

The sacrifice ceremony is not offered to the spectator to be read in a linear narrative. Image selection and editing does not intend to be explicit. We propose to understand that this kind of may inform, but not necessarily communicates. This a communication paradox. Consequently we believe that in "Heritage Games" the fragment has taken the place of the masked original scene of the rite. We also believe that the absence of the sequence of the slaughter of the rooster, that the artist has intentionally avoided, is as powerful as its presence. Meanwhile, the circular projection on the floor concentrates a powerful visual field, showing sequences where the victim – the rooster -is emphasized. Whoever focuses its vision on one screen, will be unable to watch another one at the same time, and will then require a simultaneous multimodal perception. This fragmented and simultaneous narrative is consciously redundant, as an accurate proposal of the meaning field which is offered to the spectator.

Photograph provided by Clemencia Echeverri.

Four screens emit fragments of a sequence, the remaining four issue another frame with a former or subsequent image. As it has been suggested, this art proposal procures a redundant language, which provides order to the perceptive and comprehension field, bearing a symmetrical disposal of the screens, and the resemblance between them, showing similar frames of the recorded image in simultaneous time. We propose that this singular way of image devising raises the information level, offering the spectator an experience where the artist aims to "draw space and tighten the spectator's gaze". The tense atmosphere that was present in the sacrifice field is also present in the exhibition room where the spectator is confronted with the death ritual: the "Party of the rooster".

Photograph provided by Clemencia Echeverri.

The Installation requires screens emitting video on two walls and a projected video image on the floor, in the environment a surrounded sound field enables the visitor to perform the experience which the artist defines as being capable of "transmitting shock and emotion from micro- narratives: a form of what is hidden and almost imperceptible that structures fragments typical of the culture" xv . The powerful dark head of a man whose eyes are blindfolded, are shown in a close up on the screens, he is the member of the community who has been chosen to wield the machete. In another close up, the image of the machete is shown, and also the foreground of the hand that holds it. Meanwhile the emphasized projected image on the floor shows sequences where the red eye and red peak of the rooster are seen. Predominating and amplified the visitor can see the cock's head emerging at ground level while his body is buried. Its crest is useless to seduce the female, its peak a useless weapon in order to defend itself from Men and their machetes. The rooster's head will fall after the metal hit, but the scene is not displayed on the screens, the artist points out: "It is on these scene of drowning and torturing the animal that I focus the camera as a witness" xvi. Yet death is only present within its invisibility.

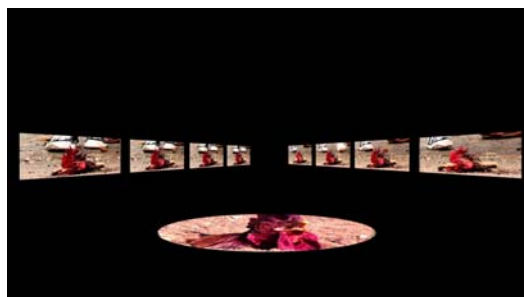Photograph provided by Clemencia Echeverri.

Echeverri's Installation proposes fragments and omissions, amplifying an utter tension affecting the consciousness of the visitor/spectator and irritates the ones who would likely see the act of execution in the foreground. Death and violence

are involved yet, offstage. The sound field is a fruitful factor in this artist's work. She highlights sound constructions in her Multimedia "Voice" or "Treno" (2009) where human voices are a significant instrument of the semantic field proposed, forwarded in this piece of art, to oppose the absence.

2. "Heritage games". Its semantic field

"Heritage Games" has a powerful hermeneutical dimension devised with a complex set of technologies. This narrative was devised *for* and *with* technology, as required by a Multimedia Installation. This work of art creates a surrounding environment where the germinal intellectual procedure is displayed and made visible and audible due to a set of digital technologies. We understand that the dialectal accent of a digital immigrant, as the artist is, is clearly audible in this specific Multimedia. Therefore, "Heritage Games" would be devised for a spectator who would pierce the technical support, favoring a subjective appreciation and enabling its subjectivity to face the semantic field. If acknowledging is to identifying whatever one already knows, and "presupposes an accumulated gnosis capital " xvii the spectator may not be aware of the existence of the rite performed by a particular human community - such as the Colombian Chocó Valley ceremony - but we understand that the Multimedia would anyway and necessarily impact on every visitor of this Installation, even no recognizing the specific signs chosen by the artist. The spectator would attend a semantic field where he or she might interpret death, victim, victimizer, impotence, masculinity, derision.

"Heritage Game" does not show any visible interface. It does not interact with the spectator who cannot turn off the screens, nor lower the sound, neither complete the missing fragments. Seeing and not seeing, as decided by the artist is actually an instrument of the narrative decided for this work of art. As already said, "Heritage Game" is not proposed then to be interactive; there is neither a gadget allowing the visitor to save the animal nor another one to defend it from the machete. The spectator assists the Multimedia disarmed as the rooster.

Photograph provided by Clemencia Echeverri.

The voice "heritage" cited in the title necessarily refers to the one who inherits, and consequently and somehow only who assumes a past time as a legacy, is able to inherit . The word "game" which completes the title would then work, as an ironic substitute for "ritual" or "feast" as it is actually called this tradition in the Chocó Valley.

Photograph provided by Clemencia Echeverri.

The image showed above , immediately evoke a parallel: one of the sequences projected on the nine screens shows the head of the defenseless rooster beside human feet. In the "Guernica" (Pablo Picasso 1937) the head of a warrior (also fallen on the floor) is separated from his torso and is like the rooster's head, close to the leg and horse shoe of a wounded horse. Then in both images we can see the widely opened eyes of the hero, as we can also see the terror of both animals. Horse and rooster are a universal way to cite victims of a violence performed by Men.
"Heritage Games" is a Video Installation devised and made possible due to New Technologies which do not blind but highlight its narrative, allowing us to propose this work of art as a palimpsest, as the rewriting of a ritual, which was scribed in the collective memory in the past, and is still visible in the present. Present time as a surface, where the artist rewrites, with a new calligraphy and a different dialect, the dialect of New Technologies.

IV
A NON- EMPHATIC CONCLUSION
1. Digital natives facing the rooster's sacrifice.
We conclude that digital natives, in correlation with their dialectal pursuit of "mutation, innovation, change, evolution, development, crisis, renewal and reform" (*v.supra* p: 2) might be prepared to enjoy this Multimedia, as it proposes an environment surrounded by screens, images and sounds. This work of art might transport the spectator to its familiar scenario of digital devises, simultaneity and multitask habbits. "Heritage Games" will probably confront the native spectator with an unknown ritual or an unknown purpose for the ritual. Nevertheless, he might feel willingly and actively experiencing a work of art, devised with

technology, familiar to his cultural dialect. A native spectator could possibly feel transported to a scenario which does not propose action, but proposes feeling. We may also conclude that natives might not inquire about hidden meanings that might be deducted by inquiring *under* or *within* the Installation surface. Whatever is to be understood or felt will objectively be supported by what is actually seen or heard when visiting the exhibition room.
    On the other hand, in the process of wondering about immigrant community's behavior in relationship with "Heritage Games", we suggest they might wonder about whatever captured the artist's interest towards an ancestral rite, focusing on a singular ceremony and to work on it as an art proposal. We believe immigrants might inquire about the process of recording and selecting scenes or the procedures required for recording sounds, the accurate decisions taken by the artist in order to select sounds and voices captured during the performance of a "party", performed by the Pacific Ocean on Colombian ground. Immigrants might also wonder about the vicar ceremony which the artist invited the community to perform for a second time, in order to record and photograph the "actors" who, performed in front of Echeverri's cameras, so as to create a simulated scene, proposed to integrate the tidy devising of this work of art which enables the immigrant spectator to interrogate himself and reason about reality criterions, and probably, and hopefully, gender criterion.
    The time spent by the artist in devising the narrative – attending the ceremony on the field, sound recording, selecting characters for the performance, analyzing, recording and photographing, selecting, editing, in order to make possible the Installation - might be evaluated by the immigrant as a relevant working process, as important as the time destined to technological fields in order to device this Multimedia Video Installation. We might conclude that the digital immigrant community would focus its attention on the narrative issues and its necessary technological support, impossible to be separated from the semantic field, however highlighting the multiple connotations "Heritage Games" might alight.
2. Re-cognize
    As pointed before, Gubern (1996 c: p 15) xvii quotes that the process of recognition requires identification; re- cognizing assumes a knowledge capital accumulated by the subject in its past, then once confronting each new act of perception with what is known, recognition is possible. It is certainly impossible to speculate about the past and the knowledge capital

accumulated by the digital native when being surrounded by the device "Heritage Games" or being in front of "Play" but it is possible to deduce that they might highlight the technological performance of a Multimedia art work, understanding the technological device as the narrative itself.

Meanwhile the immigrant's accent might be put, in both art proposals, on rituals, cultures, history, meanings, prioritizing the narrative as a subject expressed through technology.

At the same time we understand with Eco (1962) and Barthes (1968) that the work of art, whatever is its medium, destination or form, would be completed by the subjectivity of the spectator, regardless their dialect, either as a semantic field expressed *inside* or *underneath* the surface of a work of art.

The issue we are finally proposing is the existence of a different regard towards both works of art proposals, synonym of "electronic semiotics". Digital natives might underline the engineering of a Multimedia piece of art. Born within the digital era, technology is for this community, significant itself. Its knowledge capital allow the native to re-cognize the technologic dialect, and understand interaction, screens, interfaces and wiring, as familiar items of its epochal context. Meanwhile we cannot say digital immigrants devise their art work because of the existence of a singular technology. On the contrary, they have embraced these items to their art language, however highlighting the devising and reading of narratives from a perspective, where the emphasis is put on understanding technology as a cultural and anthropological value.

We believe that either spectator would actually feel the impact of "Play's" Soldiers being playfully manipulated by the puppet players. At the same time every spectator will be aware of a community deriding a harmless victim, regardless that the victim is "but" a rooster. These narratives proposed by both Multimedia, "Play" or "Heritage Games", will actually impact on either spectator.

2.1. Art Dialects

The difficult intent to compare capacities between both collectives shows as a result that it is impossible; it is impossible and useless as measuring water with a yard scale. We propose that natives build their intellectual process and behaviors within ICT society that they have become familiar with, ever since they were born, so they emphasize technology's instrumental practices assuming them naturally. New Technologies and virtual environments are incorporated to their lives as a skeleton, not as a skin. Virtuality actually becomes their identity, and they show a practical behavior that they are

able to translate to their art work. So this paper does not intend assessment criteria. Natives and immigrants generate ideas and behaviors out of their own life experience, which builds up their dialect. Art is a dialectal response to the artist's context, a "social artifact". We would like to put an end to this paper by estimating, neither affirming nor concluding and, along with Baudrillard (1996) propose that "in the heart of video cultures there may be a screen but not necessarily a regard".

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ii   Prensky, M. A new way to look at our kids. On The Horizon MCB University Press, Vol. 9 No. 5, October 2001

iii   Andrada, A. Ibidem

iv   http://www.lanacion.com.ar/nota.asp? nota_id=1285503 Artículo "De nativos digitales a náufragos en la red". San Martín, R. domingo 18 julio 2010.

V   http://www.flacso.org.ar/educacion/ en-los-medios/logicas-en-juego-por-ines-du ssel

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vi   Gubern, R. Del bisonte a la realidad virtual. La escena y el laberinto. Anagrama. Barcelona. 1996.

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vii Paz, O. "Apariencia desnuda. La obra de Marcel Duchamp" Editorial ERA. México, 1979.

Viii "Bicycle Wheel" is a paradigmatic work of modern art, which is considered one of the first reactions to the narrative proposed by the twentieth century avant garde tendencies. Wajcman (2001) has baptized this piece as "the object of the century".

IX Weibel, P. Arte algorítmico. De Cézanne a la computadora. Seminario. Plataforma Minad de UNESCO. 2004.

x   Danto, A. El abuso de la belleza. La estética y el concepto del arte. Editorial Paidós. Buenos Aires .2003.

xi   We refer here to experiments carried out by Moholy Nagy at the Bauhaus (1919/1933), which explored the possibility of performing art with projected lights, he creates a "light modulator" which is no longer an "artifact". These experiences were consolidated in the late forties an fifties with the introduction of kinetic art and sculpture.

xii A taxonomy of digital design and first art experiences performed with the use of a

computer there is an article (in Spanish language) :"Art and computers" ("El arte y el ordenador"   ) http://descargas.cervantesvirtual.com/servlet/SirveObras/12593400880143731865846/003162_4.pdf

xiii This term is mentioned to refer to Lin Pey Chwen technological works of art. See www.digiarts.org.tw

xiv Clemencia Echeverri's team: Sound by Nicolás Guarín and Clemencia Echeverri. First camera: Andrés Guzmán. Second camera: Diego león. Photography: Clemencia Echeverri – Camilo Echeverri. Sound Design: Daniel Prieto. General edition by Diego León. Edition assistant: Víctor Garcés. Interactivity (Projected and not finally executed): Martha Patricia Niño.

xv Cited by Clemencia Echeverri p: 38. Published in "Clemencia Echeverri-Sin respuesta" "Clemencia Echeverri- Un unsered" bilingual edition (Spanich/English) .Universidad Nacional de Colombia. Bogotá 2008.

xvi Cited by clemencia Echeverri p: 34. Ibidem

xvii Gubern, R. "Del bisonte a la realidad virtual. La escena y el laberinto". Anagrama. Barcelona. 1996.

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