

BASIC DESIGN FOR THE INTERACTIVE ARTWORK *IMAGE GARDEN* BASED ON THE TRADITIONAL KOREAN MYTH *LADY WONANG*

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ABSTRACT

The aim of this study is to propose a new framework for interactive artwork through the Korean archetype. Based on the framework, we proposed a basic design for an interactive artwork called *Image Garden* by applying the Korean myth *Lady WonAng*. In the myth, *Lady WonAng* bloomed in a wasteland and saved the world, triumphing over adversity through her devotion. Based on case studies – narrative form, activity theory and pleasure framework – the research extracted three factors for producing method from myth text for an interactive artwork. This framework creates an opportunity to produce an interactive artwork to attribute basic design, artwork structure, embodiment of contents and creativity. Using this framework, we propose a basic design for the image garden using a narrative approach. The audience member makes the images of flowers bloom through his or her own actions as *Lady WonAng* or as a character in a wasteland overcoming trials in an environmental crisis.

INTRODUCTION

Background

Interactive artwork is developed by new digital technologies. New technology includes wearable computing, multi-modal devices, N screen and cloud computing. When applying these technologies, how could interactive artwork change the artwork content? A basic idea is that new digital technologies stir the audience by installation. And then the installation is stirred by the audience's reaction. The audience's experience is created in this way. In interactive digital art, the artist is concerned with how the artwork behaves, how the audience interacts with it (and possibly with one another through it) and, ultimately, in participant experience and their degree of engagement. [1] Audiences participate in interactive artwork installations in various ways. This research focused on audience activity because action reflects the audience's desire. Another instance of audience participation could be a coincident and momentary reaction. Action only generates audience action.

The basic structure of the interactive artwork comprises three factors. [2]

- Input – audience participation
- Medium – installation or device
- Output – contents

Input

The input in interactive artwork is generated by audience participation. The basic audience participation is physical gestures and audience movement. But the development of computer technologies, cognition, psychological stimulus or very small change in the body become the input data to operate the installation.

Medium

The audience participation acts on the medium – the artwork installation, screen, object or wearable device. And then medium interacts with the audience.

Output

Output by interactive artwork installation is varied. It is important to create an embodiment for aesthetics. The audience's experience brings on changes in emotion.

The participation of the audience creates input data and is mediated by installation and embodies on the output, becoming the artwork content. The overall process is aesthetic experience through the interactive artwork. Thus far, research for an interactive artwork has focused on making an installation using computer science. So much of it seems to overlook audience participation and embodiment of artwork content. The research direction must change in fundamental ways using two extended factors. One is the extension input data affecting the audience. Another is the output data mediated to affect the audience. Two extended factors are mediated by installation. Although the digital technologies for interactive artwork have been developed, the basic process of interactive artwork installation is as follows. [3]

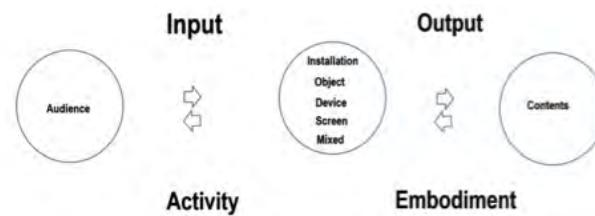


Fig. 1. Basic structure of interactive artwork installation.

The most important thing is how to improve audience activity for input data or to raise the quality for embodiment for output data. The enhancement for digital facilitates a reaction to an installation by the audience. For it realized that the interactive artwork should arouse a desire in the audience to operate an interactive artwork installation. How does it affect extended input and output to installation? How does it affect creative embodiment? It is time to focus on an archetype to stir the desire of the audience.

MOTIVATION

An archetype is a statement, pattern of behavior or prototype that other statements, patterns of behavior and objects copy or emulate. Archetype is a universal story to give pleasure and create sympathy among people in imaginary ways. Archetype give creative inspiration basic structure and embodiment for artwork. Character and narrative are the basic factors in archetype. Producing artwork

based on archetype is related to extending creative contents and finding a universal structure for artwork content. An archetype is applied because finite humans have questions about origin and roots and want to find their identity. Traditional artworks have their own structure and imagery. Characters in the artworks fight traditional values and combat old, conservative groups. The character may win or lose in a traditional society, but ordinary people want to know the process of resistance, not knowing the outcome. The character gains readers' sympathy.

For this reason, research focused on the myth as a sort of archetype. A myth is, broadly, any worldview-based traditional story or collection or studies thereof. The myth has a narrative for telling a story. The myth is a common symbol inbuilt in the unconscious of human beings. Narrative in the myth has patterns of human action and thinking. Therefore it is meaningful to make a creative artwork based on archetype. There are many methods to apply—subject, superhuman character, embodiment of pattern of traditional structure, symbol of images, universal feelings and narrative patterns.

Study Aims

The aim of this study is to propose a new framework for interactive artwork through the Korean archetype. Based on the framework, we proposed a basic design for an interactive artwork, an image garden, by applying the Korean myth of *Lady WonAng*.

Study Process

The following is the process of the paper:

- Case studies focus on interactive artwork creation.
- Three factors are extracted from the text of the Korean archetype.
- A new method to produce an interactive artwork applying these factors is proposed.
- A basic design for an interactive artwork based on *Lady WonAng* uses a new method.

Through this process, we proposed a new method for interactive artwork and a first version of interactive artwork in a narrative view.

LITERATURE REVIEW

Structure of interactive artwork

Fel classified four categories for interactive artwork in standard audience action. Fel proposed four categories for interactive artwork based on audience participation for embodiment. [4]

The audience affects interactive installation and reacts to the artwork installation.

The dimensions of the classification are as follows:

- Content provider: produces the raw material processed by the IDA
- Processing dynamics: variability of the process
- Processing contributors: the sources affecting the dynamics of processing [5]

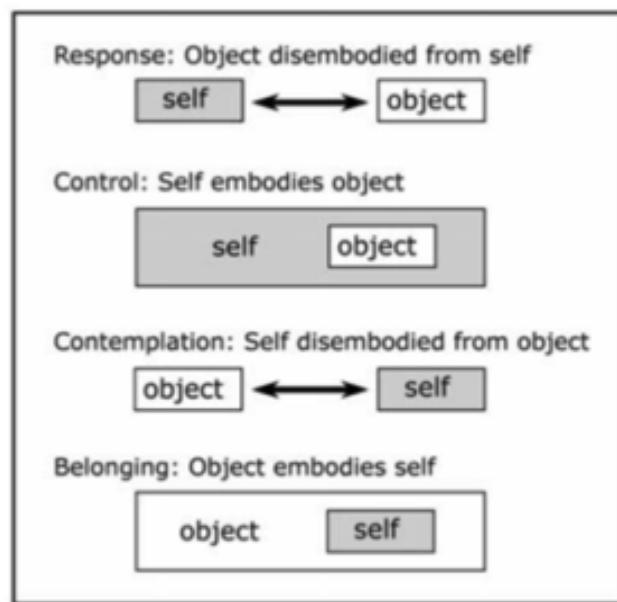


Fig. 2. Fel's categorization of embodiment. [4]

Four categories arise: the “relationship between the artwork, artist, viewer and environment:”

- Static: there is no interaction
- Dynamic-Passive: the artwork response is triggered by environmental factors
- Dynamic-Interactive: the human presence and/or actions (purposeful or not) are used as parameters for changing the artwork, whose processing rules are static
- Dynamic-Interactive (varying): the processing rules used by artwork to change its output are modified by an agent (the artwork software or a human) [6]

Clifton's paper developed the following list of techniques for scripting the interaction based on gestures recognized as a design for an interactive artwork. [7]

- Verbal – A character verbally directs the interactor to perform an action.
- Audio-visual – The setting and soundscape indicate that some action can be taken.
- Reactive – A sudden change in the drama causes the interactor to perform an action without thinking about it.
- Mimetic – The interactor performs an action after first seeing it performed by a character.

Using these research, our research proposed a new process of interactive artwork structure. The process of audience participation in interactive artwork includes an embodiment as follows:

The audience's participation in the artwork content was mediated by digital installation. The audience's direct intervention is quite different from traditional appreciation of artwork.

First, audience inputs data through its own participation – this is

the essence of an interactive artwork. The input data come from audience's physical movement, actions, behaviors or physical stimulation.

Second, digital installation mediated by computer technologies is a connecting factor between audience participation and artwork content.

Third, artwork content is embodied by various methods for artists and the audience. The method for embodiment is impossible to adjust in terms of visualization, sonification, haptic devices, smell, taste or synesthesia.

Our research focused on verbalization in performing an action in the interactive artwork and how factors affect the outcome.

Structure of interactive artwork

Otituju et al proposed SenSpace that is a multimedia installation that uses visual, audio and tactile cues to convey the Greek myth of Narcissus to the user. [8]

The audience, as Narcissus, sees the ponds and reflected self-image. It experiences changing into a flower through the myth.

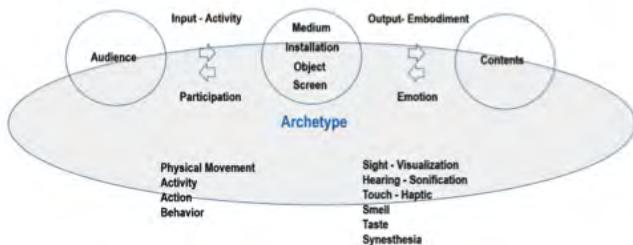


Fig. 3. Process of audience participation in interactive artwork, including embodiment

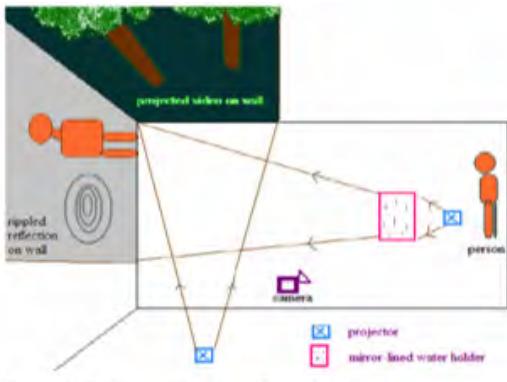


Fig. 4. *SenSpace* setup

Audience action in an interactive artwork based on archetype was just a movement in the ancient myth. The artwork represented a scene in the myth. Only the environment of the artwork was

included; visual images or audio files were borrowed. Reflecting a myth comes from a basic structure or the spirit of the age in the myth. A creative application for the origin of the myth is needed.

Mok's research proposed an interactive artwork showing the changes that may occur in the physical distances between the audience members and displayed the formation of relationships. [9] The artwork is based on the "Dinghundian," a Chinese archetype. But the research only came from the object to embody images and did not consider patterns of basic narrative and actions of the character.

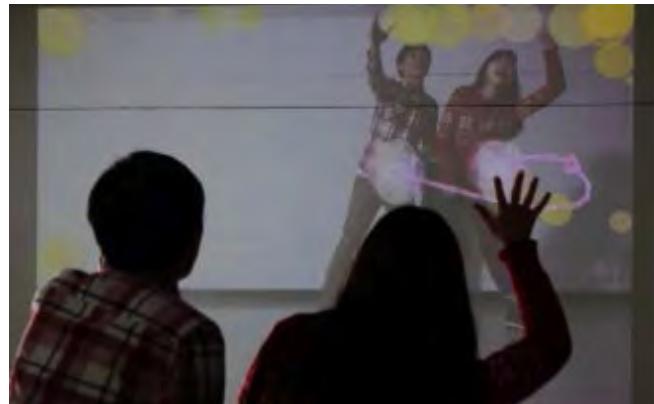


Fig. 5. Interactive artwork: *Heart, Line and Circle*.

Ryu proposed an interactive artwork based on Korean archetype. [10] VoicingElder aims to fuse Korean shamanistic ritual and twenty-first century virtual interactive technology to examine the current state of elderhood in Western culture and to contribute in positive ways to the new elderhood that we face today.



Fig. 6. *VoicingElder*, an expressive storytelling platform for the senior population, using virtual puppets.

The research contributed to the understanding of shamanism and Korean traditional feelings. The action of the audience in the artwork reflected the essence of the Korean archetype. The research will propose an essence of spirit of the Korean archetype. A total framework for an interactive artwork based on archetype is needed. This paper will create a concept of the Korean archetype in an interactive artwork.

CASE STUDIES

To make the new framework from myth text to interactive artwork, this study studied three cases – narrative form, activity theory and pleasure framework.

Narrative Form

Narrative form for interactive artwork is a new framework for the artist and researcher to converge in terms of new technology and narrative. [11] The framework involves interactive storytelling. The audience enjoyed an interactive artwork installation relevant to narrative by action. They felt the emotion based on narrative content. To enjoy narrative in an interactive artwork, the artist or researcher considers five factors.

Factor	Interactive art in narrative forms
Main-objective	The audience wants to be or to do something
Main action	Interactive actions of the audience
Obstacle / conflict / competition	Obstacles and conflict overcome by the audience actions - First / second / third obstacle
Development	Development of narrative through conflict by the audience - First / second / third development – try to overcome the crisis
Climax and ending	The climax is the peak period of conflict in the narrative as developed by the audience action The ending resulting from audience's choices

Table 1. Interactive artwork in narrative forms. [11]

ACTIVITY THEORY

Activity theory is a conceptual framework originally developed by Aleksei Leontiev and has its roots in the socio-cultural tradition in Russian psychology. A physical movement of the audience is categorized by three levels. The audience moves bodily in three categories and representations in an interactive installation. A meaningful movement affects interactive installation and creates an artwork's contents. Activity theory deals with the physical movement of humans in terms of three factors: subject, medium and object. In this way, audience action in an interactive artwork is mediated by installation-caused outcomes or artwork content. The structure is simple while expanded by social context. The origin triangle of activity theory is as follows. [12], [13]

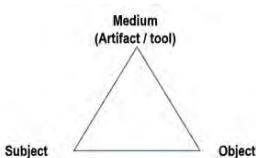


Fig. 7. The origin triangle of activity theory. [12]

The subject did act through the medium and achieved an object. The activity theory expanded by social context to adjust universal organization and private action. Through expanded activity theory, audience action is mediated by three factors: rule, community and role.

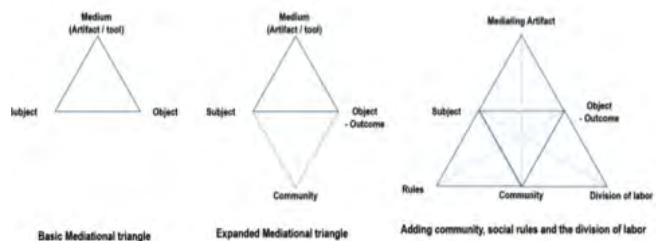


Fig. 8. Expanded meditational triangle model. [12]

Our research applied this expanded triangle to the activity of the interactive artwork model. The following model is the interactive artwork model applied by activity theory.

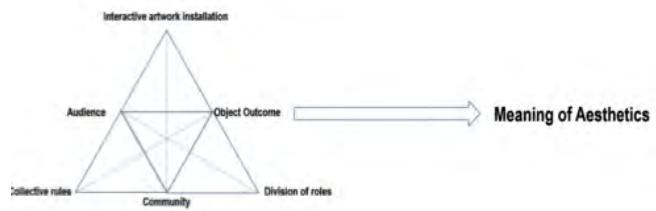


Fig. 9. Interactive artwork model applied by activity theory.

The audience outcome is its own action via installation. The outcome in an interactive artwork is the meaning of the aesthetics. The meaning of aesthetics includes pleasure, experience and stimulation of desire. Therefore, audience action is considered based on six factors in activity theory when making an interactive artwork.

- Audience: The audience in an interactive artwork is a subject to generate artwork based on action. The action by the audience is mediated by interactive installation and creates the artwork content.
- Interactive artwork installation: Interactive artwork installation is a bridge of input and output by digital technologies. Interactive artwork installation is a medium and embodiment device.
- Outcome: The outcome in interactive artwork is that of the audience and installation. The outcome comes from the artist and the audience.
- Rule: In the extended theory, the action of the audience is under the control of society.
- Community: In extended theory, the action of the audience is included in communities.
- Role: In extended theory, the action of the audience took the role of communities.

To create an interactive artwork based on activity theory, six factors of expanded activity theory are considered.

Pleasure Framework

The audience feels emotion through the artwork. In an interactive artwork, audiences feel emotion through their own action and participation. Other artworks bring emotion to the audience through appreciation and interpretation. This is a critical difference. The audience can directly change its mind and action through participation in an interactive artwork. Research focuses on emotions of human beings: psychology, sociology, anthropology or cultural studies. Emotion is categorized by either four or eight feelings. In an interactive artwork, the audience has an experience and feels emotions in reaction to the installation. The audience feels emotions in two ways: by action or by contents.

The following table adjusts the classifying patterns of flowers in the "Pleasure Framework" by Brigid Costello. [14]

Gross	Callois	Csikszent'	Apter	Garnneau	LeBlanc	Framework
Pleasure of being a cause				Power Creation	Expression	Creation
			Exploration	Discovery	Discovery	Exploration
			Problem Solving	Intellectual problem solving		Discovery
			Challenge	Application of Skill	Challenge	Difficulty
	Competition	Competition		Competition Advancement & Completion		Competition
		Risk & Chance	Facing Danger	Thrill of Danger		Danger
	Chance			Immersion Beauty	Submission	Captivation
		Vertigo	Arousing Stimulation	Physical Activity	Sensation	Sensation
				Narrative Fantasy	Simulation Fantasy	Sympathy
		Simulation	Creative Fiction & Narrative			
Aesthetic sympathy Pleasure of make believe				Love Social Interaction	Fellowship	Camaraderie
				Comedy		Subversion

Fig. 10. Pleasure Framework. [14]

The Pleasure Framework has thirteen pleasure emotion categories in an interactive artwork. These are creation, exploration, discovery, difficulty, competition, danger, captivation, sensation, sympathy, simulation, fantasy, camaraderie and subversion. Audiences feel thirteen pleasure emotions to participate in an interactive artwork. This is the aesthetic for participation and experience based on action and reaction to interactive installation. In the end, the audiences change their emotions after participation in an interactive artwork. And then their actions will change in terms of changing emotion.

METHOD

Subject

The archetypes of the Je-Ju are myths or folktales that have come down to us by popular tradition in the Je-Ju Island area. The Je-Ju myth is based on shamanism and ritual ceremony. An original myth came down via song and orally transmitted literature. Now oral ritual ceremony transfers a text literature for conservation. The

process of transferring text keeps the dialect or standardizes words. But the main character and narrative maintain the structure. Therefore, extraction in text is basic analysis through the in-view of linguistics.

As a basic motivation, this research analyzes the Je-Ju Island myth for extraction factors for method. *Lady WonAng* is a kind of SeoSaMuGa or a narrative shamanism song of Je-Ju Island in Korea. The SeoSaMuGa in Je-Ju includes 200 pieces. The Korea Creative Content Agency (KOCCA) has proceeded on a project named "Digital Je-Ju Project" on myths and folktales in Korea. Archetypes in Je-Ju are different from those of the inland area of Korea because Je-Ju is far away. The project gathered various Je-Ju archetypes about 300 works and built a digital database service for applications to procure digital content.

Extraction Method

Extraction of Narrative Form

The narrative form in an interactive artwork is related to extraction of the main scene in an interactive artwork installation. The meaningful scene fulfills various factors: setting, aims, embodiment, etc. The form sets the main audience as a character and composes an environment for adjustment.

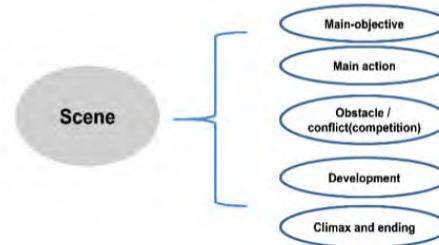


Fig. 11. Composition of interactive artwork scene.

Extraction of Activity Theory

The method from archetype text to interactive artwork in view of activity theory extracts the action verb in the myth text and analyzes its meaning. In the text, a verb shows the action of the character. The narrative comprises various verbs to act on the desire of a character. Many actions in the text are related to main characters and sub-characters. The research focused on actions of main characters. Through the extraction of the action verb in the text, we applied activity theory to create a main action in the interactive artwork.

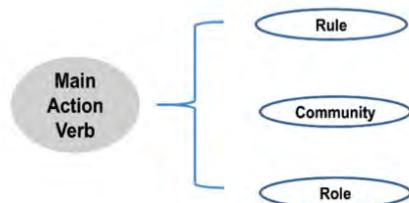


Fig. 12. Extraction of main action verb.

Extraction of Pleasure Framework

The method from archetype text to interactive artwork in view of the pleasure framework is to extract the emotion verb in the myth text and analyze the meaning.

The emotion verb expresses the character's state and the audience (reader) feels the emotion of the character's state. Empathy for a character is a major issue in the artwork. Through the process, audiences enjoy the interactive artwork.

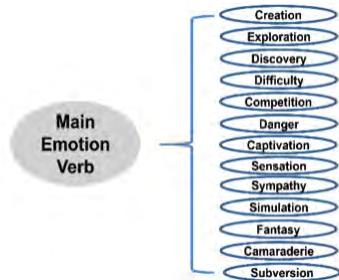


Fig. 13. Extraction of main emotion verb.

Overall Extraction Method

Narrative scene extraction

The table is an extraction scene from the archetype text. In the extraction scene, main conflict comes from the character's conflict with other.

Factors	Extraction scene	Main conflict
Scene Number	Contents of scene	Character conflict with others—antagonist, groups, society, or destiny

Table. 2. Narrative scene extraction.

Narrative framework by verb extraction

The table is a narrative framework by verb extraction. We analysis on main action verbs and emotion verbs by five factors in the narrative framework.

Narrative Framework	Main Action Verb	Main Emotion Verb
Aim	Main action verb of aim	Main emotion verb of aim
Main Action	Main action verb of main action	Main emotion verb of main action
Conflict	Main action verb of conflict	Main emotion verb of conflict
Development	Main action verb of development	Main emotion verb of development
Climax and Ending	Main action verb of climax and ending	Main emotion verb of climax and ending

Table 3. Narrative framework by verb extraction.

Overall extraction method

The following image is a basic process by overall extraction method through narrative forms, activity theory and pleasure framework. The interactive artwork scene is composed of three stages.

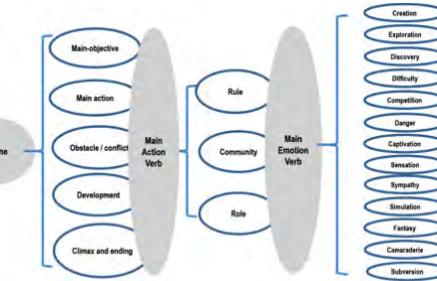


Fig. 14. Basic process by overall extraction method through narrative Forms, activity theory and pleasure framework.

Framework for Basic Design

The following image is overall framework for basic design of interactive artwork applied extraction method. The archetype contents convert into an interactive artwork through the advanced stages.

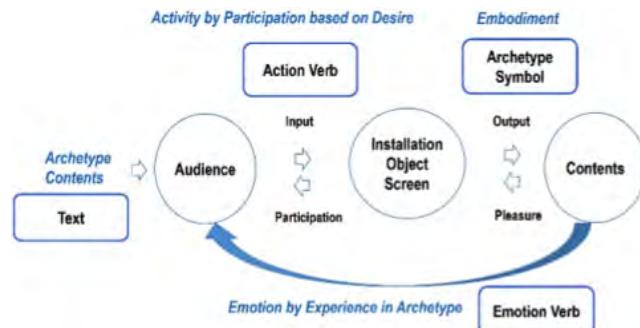


Fig. 15. Overall framework applied extraction method.

NARRATIVE SCENE AND FRAMEWORK

Narrative Scene Extraction

The table is a scene from the narrative form to create a real interactive artwork. The research categorized twelve scenes for the character's aim and main action. And then we analyzed the main conflict in the each scene to create a narrative form.

Factors	Extraction Scene	Main Conflict
Scene 1	Crisis for wasteland	To bloom or not to bloom
Scene 2	Adventure of King and Lady WonAng	To go to a destination or not to go
Scene 3	Mr. JaHyun stays, SeoCheon leaves	To leave or to stay
Scene 4	Conflict between Lady WonAng and Mr. JaHyun	To create trouble or to overcome

Scene 5	Birth of AnRakGuk	To give birth or not to give birth
Scene 6	Adversity of mother and son	To create trouble or to overcome
Scene 7	Escape and adventure of AnRakGuk	To escape or to stay
Scene 8	Murder of Lady WonAng	To die or to live
Scene 9	Boy meets father	To meet his parents
Scene 10	Rebirth of Lady WonAng via Flower Ceremony	To rise from the dead
Scene 11	Resurrection of the garden	To create blooms in a withered garden
Scene 12	Overcome crisis and spread flower	To bloom worldwide

Table 4. Results of narrative scene extraction.

Narrative Framework by Verb Extraction

The following table is the extraction result. The *Lady WonAng* text is analyzed by the next factors.

Factors	Narrative Framework	Main Action Verb	Main Emotion Verb
Aim	Audience wants the withered garden to bloom	To bloom (role)	Surprised, pleased (captivation)
Main action	Audience plants flowers	To plant flowers (role)	Passionate (creation)
Obstacle/conflict	Planted flower quickly dies	To resist the environment (rule)	Difficult (difficulty)
Developing	Bloom various flowers	To try to bloom in various ways (role)	Improved (discovery)
Climax and ending	Audiences overcome hardship and create a blooming garden	To bloom and spread the skill (rule/community/role)	Satisfied (creation)

Table 5. Narrative framework by verb extraction.

Our research synthesized these results and proposed a basic design for an interactive artwork based on archetype.

BASIC DESIGN

Basic Process

The framework focused on the combination of three factors, which create an interactive artwork. The audience has an experience with the archetype narrative through its own actions and feels emotions during the interactive artwork installation. This framework creates an opportunity to produce an interactive artwork to attribute basic design, artwork structure, embodiment of contents and creativity.

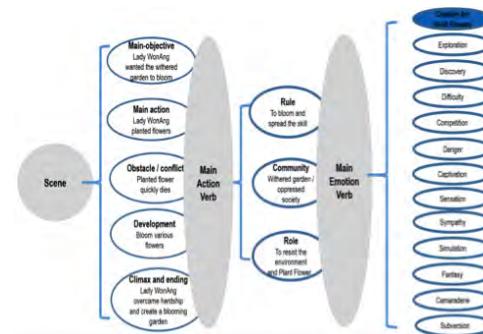


Fig. 16. Basic process for Image Garden.

The following image is the overall framework of the Image Garden based on the overall extraction results.

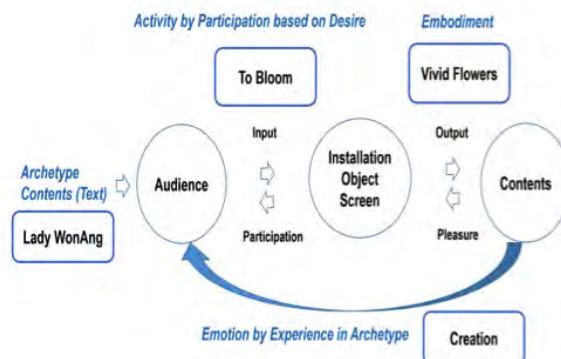


Fig. 17. Overall framework for Image Garden.

We adjusted the extraction results in a basic process for the interactive artwork.

Basic Workflow for Embodiment

The main activity of audience is to shake the body in front of the screen and change dead flowers on the screen into reborn flowers that then drift on the screen in vivid images.

And then the research creates the installation for the process of the interactive artwork.

To implement the artwork, the research uses Kinect to follow the audience action and openFrameworks to change data for dead flower embodiment.

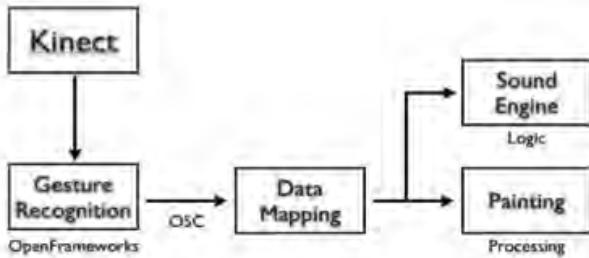


Fig. 18. Workflow for Image Garden.

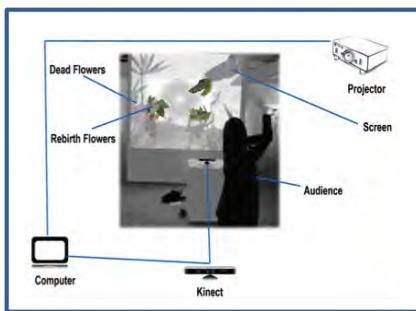


Fig. 19. Workflow of Image Garden.

The audience as the character of *Lady WonAng* feels the emotion of rebirth and spreads flowers on the screen using the Korean archetype.

CONCLUSION

We proposed a framework to convert text of a myth into an interactive artwork through narrative, character activity and emotion. Using this framework, we propose a basic design for an interactive artwork called *Image Garden* by applying the Korean myth *Lady WonAng* using a narrative approach. The audience will experience the world of Korean myth and experience the meaningfulness of their own actions in making a flower bloom in the artwork, recognizing the devotion of human beings to the value of a traditional Korean story.

Future Work

Future works will be as follows:

First, we will establish a framework from archetype text to interactive artwork analysis for other Je-Ju myths.

Second, we will evaluate the meaning of the framework of an interactive artwork based on archetype.

Third, we will complete an interactive artwork, Image Garden, as a complete artwork.

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