A GENERATIVE FRAMEWORK FOR COMPUTER-BASED INTERACTIVE ART IN MASS TRANSPORT SYSTEMS

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Abstract

Over the course of the past decade the MRT (Mass Rapid Transit) stations in Taiwan have become open air art galleries: with more prominent and frequent display of various artistic creations in stations, including interactive artworks. However, unlike the audiences in more meticulously choreographed exhibition contexts, those in stations are usually involuntary. New criteria for the creation and evaluation of artworks in these context are necessary to enhance the connection between the audience and the artwork, and to elicit meaningful experience via interactivity.

This research aims to uncover the critical factors that can turn an indifferent passenger into an explorative participant, subsequently leading them to obtain meaningful experiences through interaction with computer-based interactive artwork. This research focuses on artworks that are permanently installed in the stations, with three case studies conducted in MRT stations forming the backbone of the research. Field observation was the first step in each case study, conducted in order to understand the fundamentals of the interactivity between the passengers and the artworks. This was followed by in-depth interviews with the passengers and three professional interview groups.

A critical Analytical Framework was formed throughout the course of the research, identifying five engaging characteristics: Incentive, Transfer, Accessibility, Play, and Challenge. These five characteristics were eventually reapplied to re-examine the case studies and the content of the

interviews with the professionals. The findings of this research articulate how the Analytical Framework can be adopted in future research intended to create the conditions for more meaningful art-interactions.

This Analytical Framework will assist artists, designers and researchers in their pre-planning and follow up evaluations of the degree of engagement generated by computer-based interactive artworks displayed in transport hubs. The interest that the outcomes of this research has attracted in the field suggests that the framework could be extended to the examination of various computer-based interactive artworks in similar public contexts. In this context, the framework would play a valuable role in uncovering a more dynamic paradigm used to illustrate how meaningful experiences can evolve in similar public spaces.

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I dedicate this thesis to my dear grandmother **林黃金寶**, who passed away in the first year of my PhD study. Nevertheless, I believe she is still watching and looking after me.

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Glossary

Interactive Art：Computer based artwork employing a combination of technologies such as sensors, video cameras and electronic tracking devices. The presentation of interactive artworks frequently incorporates multimedia effects responsive to the participants. The feedback is displayed via various computer based interfaces that respond to gestures and are able to trace the presence of the participant which can be instantly perceived by the audience.

Public Art：Work, event and activity that is planned, displayed and performed in physical public spaces including public buildings (e.g. MRT station) that are usually accessible by the general public. Works in professional art exhibition spaces are not public art.

Meaningful Experience：An experience fulfilled and derived through interaction with computer based interactive artworks. The content of experience can be a perception of artistic intentions or a process of learning, exploration and finally realisation. The meaningful experience discussed here does not have a definitive quality that is exclusively defined by artists. This experience can either have an intended or received meaning, which means it could be an individual encounter. Nevertheless, this does not suggest that the experience is allowed to grow arbitrarily without any basis; instead, it is navigated and developed out of context that is preconceived by the artists.

Hybrid Art Form：An artwork created in multiple media rather than in a sole medium. Hybrid art in this research means art that is not presented or highlighted by its original material quality. It is embodied as a composition or an integrated art presentation of mixed material, technology and media. For instance, the artworks studied in this research were exhibited essentially as sculpture that consists of various computers, electronic sensor devices and interactive

technologies, while the involvement of the participant is deemed as an indispensible element. The sonic and sculptural elements of *Legend of the Phoenix* exemplify a hybrid art form. Works such as oil paintings or static sculptures in multiple materials, i.e. inlaid stone, are not hybrid art forms.

Initial Analytical Framework

Dominance Transfer：This characteristic is the transformative capacity retained by the participants which allows them to alter the presentations of artworks. The feedback being produced is instantaneously distinguishable so as to encourage further interactions.

Mind-Orientedness：This characteristic is constructed through familiarity that facilitates the participants' acquisition of artistic intents and/or development of fulfilling experiences.

Accessible Challenge：This characteristic is an appropriate tactic designed for a specific context to amplify engagement with the participants and prolong their sense of curiosity towards the art installation.

Playfulness：Like 'Dominance Transfer' this characteristic enables commencement of physical interaction. However, Playfulness is distinguished from Dominance Transfer as it is built upon that premise, while it furthers interaction and exploration, this is process is usually enacted actively by the participants in an attempt to discover the narratives or interactive mechanisms of artworks.

Analytical Framework (amended after the second case study, see pp.136-147)

Incentive：An important characteristic as it does not require an active input from the participants to trigger an initial interaction leading to a journey of interactivity between the participants and the artwork. Without this instrumental element subsequent interactivities may not proceed. Incentives can take on multiple forms. Common elements are most often acoustic or visual but can also include other sensory experiences.

Transfer：This characteristic is a transformative capacity reserved for the participant. It allows the participants to control and/or manipulate the course of interactivity and to share a sense of creative connection to the artist, and very often with other participants. The feedback from this to-and-fro interaction often takes place in real-time and is clear enough to prompt the participants to contribute further inputs.

Accessibility：This is the characteristic that builds upon familiarity, facilitating the participants' appreciation of and further engagement with artworks. This may not necessitate the need for clear goals, or have encouraged the participants to achieve or reveal specific meaning. Instead appropriate prompts may be beneficial and may lead the participants to obtain unique meaningful rewards and or fulfilling outcomes.

Play：This characteristic is an ice breaker that enables process of exploration, usually activated by the participants with attempts to discover the narratives or interactive mechanisms of artworks. Play, in the research context, often contains enjoyable, playful, effortless and unexpected elements that lure the participants to further engage with the art as well as to urge them to look closer and to participate more deeply.

Challenge：This is a strategy that may prolong and intensify the attention-span of the participants. With dynamic and yet pertinent challenges, the participants may be encouraged to explore and engage at a deeper level, leading them to gain a more fulfilling experience. It is commonly observed that people feel intrigued and sometimes engrossed by challenges and unexpected results when they feel in control and able to cope with challenges.

MRT：Mass Rapid Transit is the underground/metro system currently operated in the two major Taiwanese cities Taipei and Kaohsiung.

DORTS：Department of Rapid Transit System, TCG, Taipei MRT is a governmental company run by Taipei city government in charge of planning and construction of MRT stations.

Arts Act：An abbreviation of 'Culture and Arts Reward Act' used in this research. This act is the first law regarding encouragement of art practises and beatification of public spaces passed in Taiwan in 1992 (see Appendix v, p.88).

Regulations of Public Artwork：An abbreviation of 'Regulations Governing the Installation of Public Artwork' which is an extension law derived from the 'Article 9 of the Culture and Arts Reward Act' in Taiwan. The regulations first legislated in 1988 stipulate guidelines for the design (e.g. methods of artwork solicitation) and examination (e.g. forming of artwork selection committee and fundamental criteria of artwork examination) of artworks under consideration for installation or implementation at specific public spaces (see Appendix v, p.100).

Audience：All people passing through the space in which the artwork is installed, of which participants are a sample. Participants are a subset of this wider group.

Participant：Passengers or audiences interviewed as part of this or other studies. Passengers or audiences who have interacted with art installations and have been either actively interviewed or passively observed for this study. This encompasses the pilot studies, case studies and supplementary studies.

Chapter One — General Introduction

1.1 Rationale and Background

In '*The Practice of Public Art*', Calhoun and Kendellen (Cartiere and Willis 2008 p.167) note that "Interactive installations have become popular in the space since the audience seems to be ready, willing, and eager to participate."

Computer-based interactive technologies, including electronic devices, are becoming more commonly utilised as a medium for artistic expression and are increasingly presented in various public contexts, for example: Jaume Plensa's interactive *Crown Fountain* (2004) in Millennium Park, Chicago (Millennium Park Chicago 2010), UnitedVisualArtists' *Volume* (2008) at V&A Museum, London (United Visual Artists 2009) and The Fun Theory's *Piano Staircase* (2009) at Odenplan, Stockholm (Volkswagen 2009). These interactive art presentations alter the conventional way that audiences perceive and experience art. These artworks engage audiences in an active manner, frequently provoking sensory responses by repeatedly suspending the audience's attention through real time responsive multimedia effects. This diversifies forms of interaction and prompts attempts to ascertain the magic-like mechanisms behind these artworks. However, it is not always clear whether audiences are able to obtain meaningful experiences from such interactive processes. This lack of clarity prompted this study's key research question with reference to interactive art in Taiwan's MRT (Mass Rapid Transit): *Whether audiences (passengers) are able to obtain meaningful experiences through the interaction with interactive artworks in such spaces?*

This issue has also attracted art researchers' and practitioners' interest, leading to studies intended to evoke interaction and provide more fulfilling audience experience in research contexts. For instance, Graham's (1997) series of case studies in gallery settings led to the

presentation of a unique concept, ‘Host’, intended to facilitate interactivity between audiences and artworks. Birchfield et al (2006) and Bilda, Edmonds and Turnbull (2007) have carried out numerous studies on audiences’ perceptions and reactions to computer-based interactive art in public contexts. The questions raised, methodologies, and outcomes from these earlier studies of interactive artworks and experience provide a constructive reference for the foundation of this research.

In addition, extensive research has been conducted in other disciplines on the enhancement of experience, for example Csikszentmihalyi and Csikszentmihalyi’s (1988) in depth studies on how people enter their ‘Flow’ within diverse social contexts. Their study was intended to enrich experiences in different living perspectives. Eisenberg (2007) proposed ‘Jamming’ as a conceptual tool, elaborating on how ‘Jamming’ facilitates communication and organisation. Murray (1997) explained the engagement of game players within the cyber world through three artistic characteristics. The theories and outcomes of these studies focused on enhancing experience have profoundly influenced subsequent interdisciplinary research on audiences’ perceptions and reactions, providing crucial references for this research. These earlier studies offer a basis on which this research has expanded the study of interactive experience, both by exploring the notion of meaningful experience (see Glossary, p. xii) and, more significantly, by drawing on elements of these earlier studies in composing an initial Analytical Framework (see Glossary, p. xiii).

While this research should be viewed in the greater dimensions of the above studies, its primary focus is on the interactivity generated between participants and artworks in freely accessible public spaces not specifically used for art purposes. Instead of completely immersing itself in a web of philosophical theories, or conducting research in laboratory settings, this research has adopted a different approach based on a series of case studies. Three case studies were

conducted in the MRT stations in the Taiwanese cities of Taipei and Kaohsiung. The majority of passengers here do not spontaneously seek artistic intent or experience, since appreciation of artworks is usually not a priority in such spaces.

The methodological phases began with informal field observations at the MRT stations, where I familiarised myself with the surroundings. Similar to Calhoun and Kendellen' observations (Cartiere and Willis 2008); I noted that display of computer-based interactive and electronic based artworks has become increasingly common in MRT stations. This prompted me to initiate research on interactive experiences of the passengers within these spaces. The research phase was then followed by the pilot study (see Appendix ii, pp.13-29) intended to test the rudimentary research methodologies and to unfold the pivotal research question: *Whether audiences (passengers) are able to obtain meaningful experiences through the interaction with interactive artworks in such spaces?* In order to construct an overview of the research field, I visited Taipei and Kaohsiung MRT stations several times with the purpose to observe and gauge the physical reactions and sensory responses of passengers to the artworks. Three significant questions emerged from this fieldwork:

1) What experience do the passengers obtain through interaction with the art installations?
2) How does the passengers' experience evolve?
3) How meaningful are these experiences to the passengers?

This research developed around three case studies conducted in the MRT stations designed to explore these questions. The three research art installations selected are 1) *The Legend of the Phoenix* by Sheng-Chien Hsiao, a sonic interactive artwork that creates sound effects triggered by the presence of the passengers, 2) *Poetry on the Move* by E-Chan, an interactive bulletin that allows the participants to share thoughts via text messages with other passengers, and 3) *We are One Family* by Chiang (VERY Conception Corp.), which captures images of participants' faces

from five devices and displays theses images on five screens fitted on a family portrait sculpture. The case studies were supported by interviews with; MRT passengers, the artists who created the artworks, members from the MRT artworks selection committee, and advisors who have extensive experience in the field of interactive art, and by two supplementary case studies in art galleries (see Appendix ii, pp.30-38). Through repeated examination and analysis of the data gleaned from these different sources, as well as literature reviews, a contextual Analytical Framework was developed for the study of interactive experience. The key characteristics of the framework: Incentive, Transfer, Accessibility, Play, and Challenge, have been identified within different phases of this research. Each characteristic has been extensively re-examined and iteratively applied to the research trajectory through investigation of the interactivity between the participants, interactive artworks and interview contents. The shape of the five engaging characteristics becomes evident through the research process as the practicality of the Analytical Framework is gradually augmented.

This research aims to enhance the interactive experiences of the participants. Art practitioners will be able to adapt and employ approaches identified through the Analytical Framework, producing more meaningful, fulfilling and rewarding experiences for their audiences in broad public contexts. Additionally, it is anticipated that the research will provide empirical references for the commissioning bodies responsible for the overall planning of artwork selection and exhibition in similar public spaces.

The research findings suggest that if the Analytical Framework can be used in the early stages of creation of computer-based interactive artworks, it will facilitate participants' engagement and lead them to attain more fulfilling experiences. This thesis further analyses and explains the findings produced in four of the author's previous international publications (see Appendix vi, pp.122-148), which reflect the chronological development of this study's five engaging

characteristics. Together with the publications, the feedback received from referees and one of the papers (developed on the basis of this research): '*Meaningful Engagement: Computer-Based Interactive Media Art in Public Space*' has attracted attention from the '*Journal of Literature and Art Studies, USA*' and has been invited for paper publication (see Appendix vi, p.149) that supporting the viability and practicality of the Analytical Framework. The combination of these research findings and their reception in the field proves and substantiates the value of this research, while also encouraging its further development.

In addition to the stated aim of enhancing interactive experience and developing a practical instrument to examine interactivity, this research has engaged some interesting theoretical and practical issues concerning interactive art, meaningful experience and the play in interactive art and video games. Nevertheless, it must be emphasised that this research was by no means intended to establish universal definitions for interactive art, meaningful experience or play. These terms were merely incorporated in some encouraging findings from the research. One of the objectives (see p.8) was also to uncover some discouraging responses. This study shows how an interesting idea without a comprehensive plan and in-depth understanding of the display context may be unable to generate the meaningful engagement crucial to meaning making. Moreover, the absence of such planning and understanding may even result in alienating the audience from the artworks. In addition to the studies of three interactive artworks and interviews with the passengers in the MRT stations, one of the interview groups (members of the MRT artwork selection committee) had extensive experience in the examination and selection of artworks being exhibited in the MRT stations. Their insights contributed significantly to this research, particularly regarding the presentation of interactive artwork in such public spaces.

1.2 Setting out the Context of the Research

"There is an increasing awareness amongst artists, critics and curators that the audience's experience is of central importance to the understanding, creation and exhibition of interactive art" (Muller 2009).

This research specifically discusses experience generated between the participants and 'interactive art' (see Glossary, p. xii), as opposed to studies of development and application of interactive technology and devices utilised in the creation of art installations. Audiences may obtain more comprehensive and aesthetic experiences through physical engagement and interactivity. However, there is a scarcity of research outcomes on interactivity generated outside the gallery and carefully controlled laboratory environments. I believe it is crucial to conduct research within the space where the experience takes place in order to enhance the quality of audience experience in that specific context. Artworks that draw on interactive mechanisms can be traced back to as early as the late 1960s, for example *The Senster* (1970), a cybernetic sculpture by Ihnatowicz (2009). Nevertheless, the study of participants' perception and their reaction to interactive art has just emerged over the past decade, addressing subjects such as 'audience relationship with interactive art' (e.g. Graham 1997), 'experience evaluation' (e.g. Höök, Sengers and Andersson, 2003, Bilda, Bowman and Edmonds 2008), 'interactive experience' (e.g. Fels 2000, Bilda 2007, Muller 2009), 'understanding the experience' (e.g. Forlizzi and Battarbee 2004, Costello et al 2005) and 'designing experience'(e.g. Reeves et al 2005). Although a multitude of research has been conducted under the umbrella term of 'experience', with an abundance of outcomes and references being produced, only a handful of studies have been carried out concerning the interactivity between audiences and interactive arts displayed in freely accessible public spaces such as transport hubs.

This study aims to bridge the gap between current literature and research. The artworks selected from the MRT stations for this research were not purposefully created for research. They are fully-fledged public artwork pieces, permanently exhibited in public spaces. Their non-experimental status increases the possibility of obtaining genuine insights into interactivity between the artwork and the participants. Moreover, each artwork has been exhibited in the space for at least two years, suggesting that the passengers within the space may already have a degree of awareness and familiarity with the art installations. Hence, the participants' perception and apprehension of the work of art in the space could be a vital element in influencing investigation of participants' interactive experiences.

1.3 Objectives and Contribution

This research aims to deepen the understanding of the interactive experience with regard to real encounters in specific public spaces (the MRT stations). Through a series of progressive examinations and analysis of the participants' experiences, the contextual research strategies and outcomes produced may be applied in similar public settings. The development of adequate methods for investigating audience experiences has been found to be crucial for both presentation of interactive artwork and elicitation of meaningful experience in such public spaces. As a whole, this research aims to fulfil four objectives:

1. Obtain an in-depth understanding of how responsive multimedia effects influence passengers' perceptions and reactions. Illustrating how accessibility, interactivity and challenges relate to the passengers' appreciation of the artworks.
2. Analyse and compare views from professionals in the field, including their perspectives and preconceptions as well as the techniques they use for orchestrating interactive experiences between passengers and artworks. This is intended to elicit insights that may enhance engagement in future interactive artworks.
3. Develop adequate research methods in order to approach the participants so as to ascertain their experiences when interacting with the art installations.
4. Construct a contextual approach (Analytical Framework) for examination of interactive experience, available for artists and art researchers to adopt in crafting more meaningful experiences in the interaction between art pieces and the audience.

As the four objectives indicate, this research is intended to make four major contributions to the field. The first contribution is to articulate how passengers' experiences evolve and what may alienate them from the art installations. This offers a reference point for any individual who intends to present interactive artworks in public spaces similar to the MRT station. The second contribution is to produce references on enhancing engagement with wider audiences for artists,

researchers, commissioning bodies and relevant sectors in considering the creation and installation of interactive artworks in similar public contexts. Thirdly, this research has developed contextual research tactics and an Analytical Framework that allows pre-planning and post-evaluation of the state of engagement with interactive art presented in similar public contexts. Finally, this research offers perspectives encompassing both the theoretical and empirical outcomes relating to future creations of interactive art installations.

1.4 Interrelationships of Methodological Phases

The methodological phases were mainly applied to investigate interactive experiences of the passengers in the designated research setting (the MRT stations). The graph of 'Interrelationships of Methodological Phases' (see Figure 1-1) illustrates a brief overview of the research development.

The research phase began with several field observations prior to formally conducting the research. The repeated alternation between data collection and analysis formed an iterative research loop comprised of three major phases 1) Phase of testing methods and establishing initial Analytical Framework, 2) Phase of disclosing experience and mapping insight, and 3) Phase of refining the Analytical Framework; each phase produced research data which shaped the Analytical Framework, with interim periods between phases permitting analysis of outcomes and adaption of methodologies. This research procedure played an important role in extending study outcomes to the subsequent research phases.

The research procedure and the parallel research trajectories mutually informed one another within the three main research phases. The 'Exhibitions & Publications' strand provided opportunities to review established theories and methodological approaches. The 'Workshop & Literature Reviews' strand offered theoretical elements that to some extent steered the development of the research, and also permitted current technologies and skills to be utilised in creations of interactive artworks. This upheld the research to keep up with the progressive status of the field of interactive art.

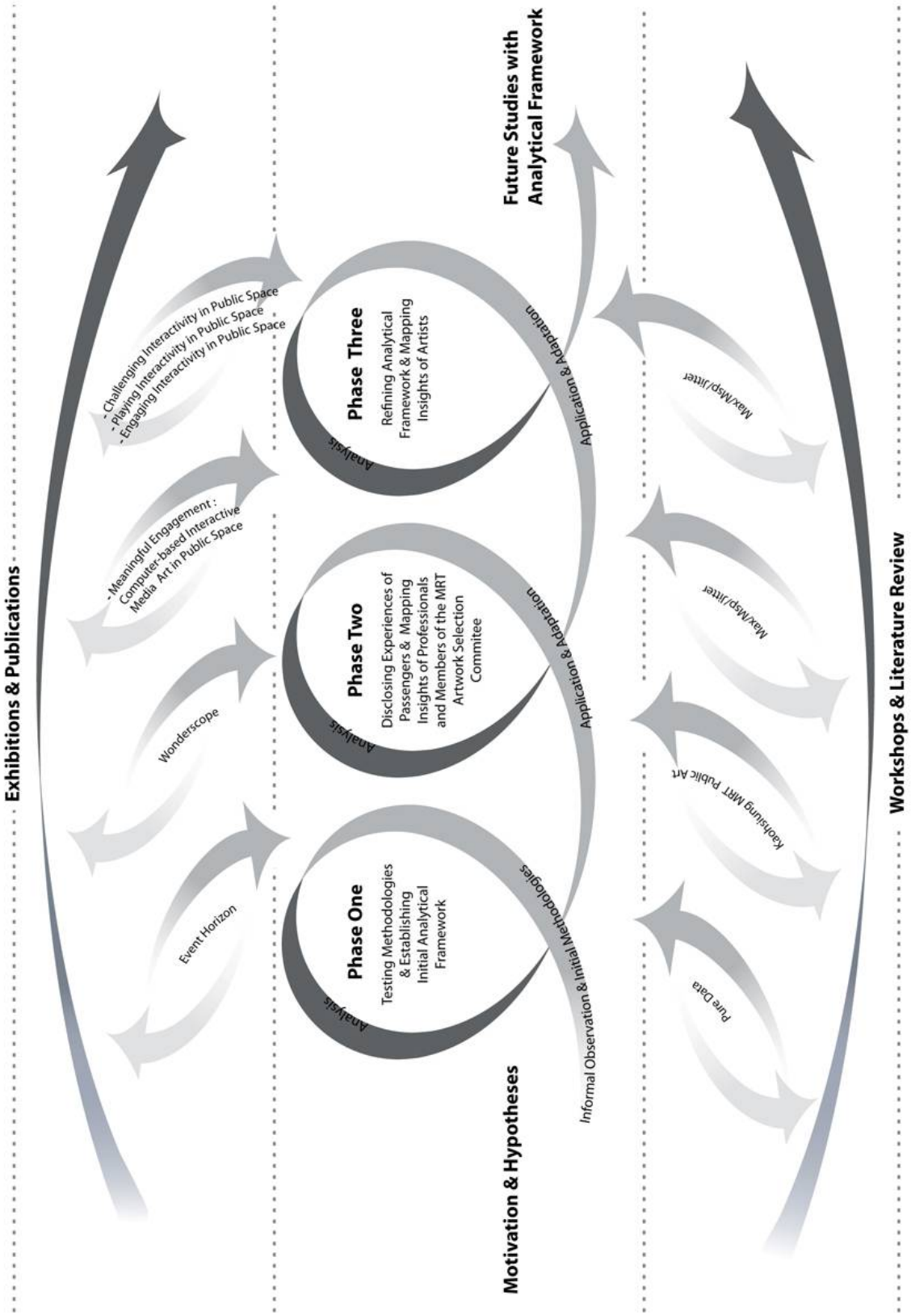


Figure 1-1: The graph of interrelationships of methodological phases

Motivation and Hypotheses

The motivation behind this research was to deepen understanding of the influence of responsive multimedia effects on passengers' perception and experience, promoting meaningful experiences through their interaction with interactive artworks. This aim was the main contributor for the commencement of this research. In beginning the research phase, informal observations of passengers' activity and their interactions with art installations in the MRT stations allowed/prompted the construction of a brief overview of interactive experiences that took place in such spaces. The early informal field studies assisted in drawing out initial forms of the research methodologies and in outlining the fundamental research question: *Whether audiences (passengers) are able to obtain meaningful experiences through the interaction with interactive artworks in such spaces?* By examinations of different aspects of the confluence of interactive experiences of the participants and forms of interactive artworks, this research has developed alternative approaches and references, creating a bridge between artists and participants.

Workshops and Literature Review

The literature review enriched and underpinned the basis of each study phase. It has been conducted throughout the research as an essential element in making informed arguments. The implementation of the review was centred on specific themes over different study phases. It commenced by locating key elements that make up computer-based interactive art in order to establish a working definition for the research art form. This was done alongside explorations of: engaging strategies, interactive experience, aesthetic experience, public art, theories of play and other relevant areas of study.

The initial Analytical Framework (see Glossary, p.xiii) comprised of three engaging characteristics was based on the review of literature and several informal field studies. These

three initial engaging characteristics were identified as: Dominance Transfer, Mind-Orientedness, and Accessible Challenge. Additionally, instead of fully immersing the study in previously established theories, this research has coevolved with and been informed by a practical approach through frequent participation in workshops, in particular those relating to applications of technology to the creation of interactive artworks and presentation of art in the MRT spaces. For example Pure Data workshop, which was run by Peacock Visual Arts Gallery in conjunction with the event 'Recorded Landscapes and Politics of New Media', held in Aberdeen (2008), and the Kaohsiung MRT public art workshop organised by Kaohsiung County government (2009) which led to the identification of the research artwork *The Legend of the Phoenix*, and both basic and advanced Max/MSP/Jitter workshops run by the Digital Arts Centre, Taipei (2009, 2010).

Phase One: Testing methods and establishing initial Analytical Framework

As an antithesis to conducting complex psychological tests in a highly controlled laboratory environment, two pilot studies (see Appendix ii, pp.13-29) were conducted in non-art spaces at the Robert Gordon University for a total period of ten days. The studies were carried out to develop intuitive and observable approaches to be applied in the subsequent studies of interactive experiences of passengers in MRT spaces. Prior to entering the MRT space, the primary task at this stage was to test the feasibility of the initial methodologies. The first experimental interactive installation *Event Horizon* was created on this premise.

The combination of a non-art space with the use of an experimental installation allowed this study to construct a physical research setting and practise interview protocol with the participants. The methods employed in this phase consisted of observation from afar and participative observation of the participants' responses and activities in the space. The art instillation and its responsive multimedia effects were often identified by participants in their

responses in the pilot studies. Together with the use of questionnaires I was able to gather sensory experience data on the participants. At the end of the pilot studies, approximately thirty formal interviews had been conducted. After analysis of the findings from the studies the engaging characteristic ‘Playfulness’ was discerned and added to the initial Analytical Framework. This increased the number of engaging characteristics to four; Dominance Transfer, Mind-Orientedness, Accessible Challenges and Playfulness.

Phase Two: Disclosing experience and mapping insights

The research in this phase was divided into two sections. Section one adopted the Analytical Framework and focused on disclosing participants’ interactive experiences within the MRT space. The adaptation of the framework helped this study focus on specific interactive features. The major studies were carried out at two MRT stations and the supplementary studies (see Appendix ii, pp.30-38) were implemented in art galleries, employing methodologies inherited from the previous pilot studies (see Appendix ii, pp.13-29). However, instead of using conventional questionnaires, a combined technique of ‘thinking-aloud’ and ‘video recall’ was employed with assistance of a voice recorder.

This method was found to be beneficial in facilitating the interview with the passengers in the MRT space. A total of thirty interviews were conducted in two MRT stations. After completion of the second case study, an extensive analysis and review of the findings from previous studies was carried out, from which the engaging characteristic ‘Incentive’ was distinguished. These findings led to the formation of a relatively comprehensive Analytical Framework comprising of five engaging characteristics.

The second section focused on obtaining insights from three UK based specialists in interactive art, hereafter the advisors, on the three contestable research areas of: interactive art, meaningful

experience and play. Issues relating to the presentation of interactive art in the MRT spaces were also discussed. The interview questions raised to the five members from the MRT artwork selection committee were also centred on the themes mentioned above. Along with the two major professional groups, the final interviewee was an engineer from the Department of Rapid Transit Systems, Taipei City Government (hereafter DORTS, also see Glossary, p. xv). Her interview was mainly concerned with the chronology of the introduction of artworks into the MRT spaces.

Phase Three: Refining the Analytical Framework

The research in this phase also consists of two sections. The objective of section one was to continue refining each engaging characteristics so as to further test usability and practicality of the Analytical Framework. By applying the framework to the third case study the features of the five characteristics were unexpectedly but fully manifested, although no new engaging characteristic was identified. Fifteen formal interviews were also carried out in this third case study, along with several informal dialogues with passengers.

Section two was primarily intended to discern the three artists' preconceptions about the capability of their interactive artworks to arouse interactivity with their audience. Furthermore, as arts professionals, their conception of the three contestable areas of interactivity, play, and meaningful experience were also gauged. The findings from both sections were added into the re-examining process, which subsequently assisted in forming up-to-date working definitions for each engaging characteristic.

Publications and Exhibitions

Publication and exhibition were both crucial practises in this research process. They not only helped unfold the research findings in different periods of the study, but more importantly they

prompted an expansion of the review of literature and periodical rearrangement and reorganisation of the research data. Furthermore, the practises provided a platform permitting the theories and outcomes produced from this research to be exhibited, examined and criticised by external professionals in the research field. The four international conference publications (see Appendix vi), to some extent, reflect the development of the Analytical Framework and also elicited interdisciplinary feedback that augmented the value of the research and informed the practicality of the Analytical Framework.

Although the MRT was the primary research context the two experimental interactive artworks *Event Horizon* and *Wonderscope*, exhibited in the art galleries (see Appendix vi, pp.152-154) yielded opportunities for observation of interactivities within different public contexts. The outcomes obtained through both exhibitions were insufficient to form a comprehensive argument to delineate general occurrence of interactivity taking place in gallery settings (a potential supplementary finding and not the intention of this research). However, these outcomes offer certain insights into the nature of the audience interaction with computer-based interactive artworks in gallery and university settings. This generates some insight into exhibition of interactive artworks in different public contexts.

Future Studies with Analytical Framework

Through progressive analysis, feedback and the information generated and internalised over the course of the research, a functional Analytical Framework for studies of interactivity was established. The research outcomes suggest that the Analytical Framework can be employed to further engage audiences and eliciting meaningful experiences. In Chapters 6 to 9, the analytical process articulates how meaningful experiences can be engendered through interactivity between the participants and interactive artworks. The three main arrows on the right of the graph (see Figure 1-1) indicate that this research is by no means a closed-end study.

The Analytical Framework has great potential to contribute to future research if adopted. The recommendations for future research, proposed in Chapter 10 (see pp.226-228), indicate that the framework does not function solely as a practical instrument to gauge interactive experience within this specific research context (the MRT space), but also can be applied to other similar public settings. Moreover, the framework can be extended or incorporated within other existing approaches. Additionally, the data produced in future studies could be used to construct a database that would provide a valuable reference on artworks in a broader public context for artists, researchers and commissioners.

1.5 Overview of Thesis

In addition to the first chapter (General Introduction), the thesis consists of nine major chapters that explain the evolution of the research. This begins with an exploration of the broader research context: outlining Taiwan's public art environment from its early period to current state. This outline is followed by a development and application of the Analytical Framework and research methods, a discussion of existing references of literature, as well as recommendations for further development of the research. These separate aspects will be discussed in the following sections.

Chapter Two

The research was undertaken within a greater public art context of Taiwan. This chapter taps into developments and changes of public art in Taiwan through an examination of their presentation, natural site places, audiences, functions and so forth. This exploration of context leads into reviews of various public art forms from outset to current state. The discussion also draws on the influences of government policies, politics and social environments on the evolution of public art in Taiwan, as well as the selection criteria of the public art, in particular the MRT artwork examination mechanism.

Chapter Three

This chapter sets the scene in the Taipei and Kaohsiung MRT stations, the designated research sites. It begins with an overview of the space, the nature of activity and presentation of artworks within the space. This section of the thesis is particularly concerned with interactive art and electronic art installations exhibited in the MRT complex. Non-participant observations of the passengers' engagement with the artworks in the spaces and the rationale behind the selection of the artworks for the case studies are also discussed.

Chapter Four

This chapter presents a review of literature that extensively surveys three contestable research areas: ‘interactive art’, ‘meaningful experience’ and ‘play between interactive art and general video game activities’. The reviews pay specific attention to the context of interactive art displayed in public spaces, which provides a theoretical baseline to support onward explorations of interactive experience.

Chapter Five

This section discusses how the research methods and the Analytical Framework were conceived. The contextual base reviews of literature that specifically survey relevant and significant issues raised in previous adjacent studies of interactive experience in various research contexts are also explored. The chapter then draws critical comparisons between different theories and approaches developed and employed in examining interactive experience and artworks. Furthermore, it cements the knowledge base that produced the methods for gathering research data and the initial Analytical Framework (Dominance Transfer, Mind-Orientedness, and Accessible Challenge).

Chapter Six

After testing the methodologies and reviewing findings of the pilot studies (see Appendix ii, pp.13-29), the characteristic ‘Playfulness’ was identified. The study then moved into the designated research context (the MRT stations). Thanks to the previous pilot studies, both the initial Analytical Framework and the proposed data collection approaches were successfully adopted. In order to maintaining clarity and consistency of terminology in this study, the four engaging characteristics were altered to: Transfer, Accessibility and Challenge, and Play. As the second case study was complete, critical analysis, reviews of and comparison with previous findings and, the characteristics of ‘Incentive’ emerged. This led to the formation of a comprehensive Analytical Framework.

Chapter Seven

Insights from three professional interview groups were examined. These groups were comprised of members of the MRT artwork selections committee, the advisors with extensive experience in creating interactive artworks and lecturing in relevant research subjects, and the artists who created the interactive art installations studied. The opinions obtained from their interviews provided an abundance of constructive references that cover multifaceted research issues such as meaningful interactivity, indispensable elements of interactive art and the presentation of interactive artworks in transport hubs. The Analytical Framework was applied to analyse the dialogues, which in turn substantially informed the framework.

Chapter Eight

This chapter discusses the third case study conducted in the MRT station. By repeatedly applying the Analytical Framework to examine different interactive interfaces and behavioural patterns, the framework's applicability for examination of interactivity was tested. This testing was intended to enhance the applicability of the Analytical Framework to this subject matter. In comparison with the previous two case studies, the features of five engaging characteristics appear relatively evident.

Chapter Nine

This penultimate chapter recapitulates the evolution of the Analytical Framework from the outset to its final state. This was implemented by re-examining the three selected interactive artworks and perspectives of the professional interviewees through the amended Analytical Framework. This further substantiated the practicality of the framework. Together, with the emergence of firmer definitions of the five engaging characteristics (see Glossary, p.xiv), it is anticipated that this chapter will play an instrumental role in assisting the adaptation of the framework to future research of interactive experience.

Chapter Ten

The final conclusion of the research highlights the features of each engaging characteristic and their development within the different research phases. This is followed by a summary of the Analytical Framework, carefully exposing the characteristics and framework's functions in constructing meaningful experience. This final chapter also addresses the recommendations for further development of the Analytical Framework and future studies, and the contributions made in the field.

1.6 Summary

The structure of this thesis offers an overview of the research and provides guidance for its readers. Although the structure demonstrates the chronological order of the research, the format of this thesis as a linear document progressing from one chapter to the next cannot reflect the constant and mutual feedback over different research phases, implementations of the study and the development of the Analytical Framework.

Nevertheless, the graph of 'Interrelationships of Methodological Phases' (see Figure 1-1), to some extent, complements this gap, enabling visualisation of the overall flow of the study. The three case studies conducted in the MRT stations are the backbone of the research, while the encounters' with the MRT passengers and their experiences of the interactive artworks in the stations provided the subject matter for examination within this backbone.

The three professional interview groups' insights regarding the research issue were attained and analysed, supporting the MRT interviews. The features of the five engaging characteristics were iteratively analysed, integrated and brought back to the research loop as they gradually emerged over the course of the research. They were eventually employed to re-examine the artworks previously studied (see Chapter 9). A practical instrument for the examination of interactivity was formed throughout the research process. It is envisaged that the outcomes of the research will provide an alternative strategy for studies of interactive experience within this less-charted territory of public exhibition spaces, with the ultimate goal leading to more meaningful art-interaction.

Chapter Two — Formation and Theory of Public Art in Taiwan

2.1 Introduction

As this research focuses on interactive experiences between passengers and interactive artworks in MRT stations (see Glossary, p.xv), works broadly categorised as public art (see Glossary, p.xii), this study begins with a general review of the public art environment in Taiwan. An overview of the research context will be illustrated through an exploration of the development trajectory of conceptual prospects and physical presentation of Taiwanese public art. This contextualisation will further facilitate the reader's understanding of the subsequent chapters. This chapter encapsulates forms of public artwork from early presentation to current state: from static statues on plinths, through participatory practises to more approachable computer-based art forms. The discussion explores these developments and changes in Taiwan and their correlation to western concepts and creative practise, specifically examining materials, media, subject matter, social background and function. The discussion also touches on the influences of foreign public art policies, local politics and social environments on the evolution of public art and the establishing of relevant policies in Taiwan, as well as criteria for artwork selection and the formation of selection committees.

2.2 Appearance of Artworks in Public Spaces

Professor Hsia, from National Taiwan University (Chang 2008) once stated, “We have to be aware that Taiwan used to be a colonial society, while ‘public’ [voice] was muted” (translated from Chinese). In an interview transcription, Christo (cited in Malcolm 1997 p.89) claims “The work of art is a scream of freedom.” This combination of colonial history with art’s propensity to express a desire for freedom has had a notable impact on Taiwan. Artworks, in particular those which are displayed in public settings, are often made to explore or convey specific ideas without regard for institutional constraints or unpredictable and varied public opinion. Over the past four hundred years, Taiwan has been a colony of Spain, the Netherlands and Japan. This precarious political and social status has, in the past, led to distortion and suppression of expression.

Very few examples of art in public spaces from the colonial period have been acknowledged as public art, those which have are mostly incorporated within architecture or are statues with religious, memorial or political purposes (see Figure 2-1). Knight (2008 p.1) argues that “if we define “public art” by its most basic precepts, then its roots reach far back in history. Its works are conceived for larger audiences, and placed to garner their attention; meant to provide an edifying, commemorative, or entertaining experience; and convey messages through generally comprehensible content.” For instance, in 1935 Manchukuo (a Japanese puppet state in Manchuria, North East China) gifted a pair of bronze water buffalo sculptures (see Figure 2-2) to Taiwan to commemorate 40 years of Japanese rule in Taiwan. The sculptures still rest peacefully in the 228 memorial park in Taipei. However, there were initially four sets of sculptures in the park, three of them were removed as they were thought to be Japanese hero figures, only the buffalos were retained as they symbolise the assiduous spirit of the Taiwanese people.

Figure 2-1: The stone arch was erected in 1901 in honor of a chaste and filial woman

Figure 2-2: Two bronze water buffalo sculptures at the 228 memorial park, Taipei

Chou (2009) highlights two examples of early artworks in public spaces in her article '*An Introduction to Public Art Policy in Taiwan*'. The first is a statue of *Hatta Yoich*[1]. Hatta Yoich was the Japanese chief engineer in charge of construction of the Wushantou Reservoir and Jianan Irrigation Waterways in Taiwan, which were completed in 1930. In order to commemorate his contribution to the Jianan area, the local residents commissioned a Japanese sculptor, Tokuda Yasokichi, to craft a statue of *Hatta Yoich*. However there was substantial ill feeling against the Japanese from the Kuomintang[2] authorities, who took control of Taiwan in 1945 after winning the war of resistance against Japan. Consequently the statue was hidden in the warehouse of the Kuantian Railway Station to prevent it being melted down to make weaponry. It was re-installed 50 years after its completion in 1981 at the Wushantou Reservoir. The second example is a huge bas-relief art piece *Herd of Water Buffalo* (555 x 250 cm) created by Taiwanese artist Tu-Shui Huang in 1930. After Huang passed away his wife donated this art piece to the Taipei City Government and now the work is inlayed into the wall between the second and third floor Taipei Zhongshan Hall in Taipei City (see Figure 2-3). According to Chou (ibid) this bas-relief art piece is recognised as the first artwork created by a Taiwanese artist and displayed in a public space. Although Chou claims this is the first artwork exhibited in public space, this study does not intend to undermine the historical significance of pre-modern works such as: calligraphy on stele (stone inscriptions) or aboriginal sculpture used in festivals and rituals. However, her examples have informed this study's understanding of the development of public art in the modern era.

[1] The statue of *Hatta Yoich* (Jianan Investigative Team 2007)

[2] The Kuomintang was the founding political party of the Republic of China following the 1911 revolution that overthrew the Qing dynasty. After losing the civil war to Mao Zedong's Communists they retreated into Taiwan in 1949. Taiwan is now confusingly known internationally as both the 'Republic of China (Taiwan)' and 'Taiwan (Republic of China)', depending on the institution.

Figure 2-3: *Herd of Water Buffalo*

2.3 Idols Glorification, Worship and Environmental Beautification

There was a wave of alteration to art in public spaces following the Kuomintang government take over of Taiwan from the Japanese rule in 1945 and after the Kuomintang retreat to Taiwan in 1949. The inauguration of the new government drove the direction of art presentation in public spaces, which was almost exclusively devoted to promulgating the new political authority and doctrine monumental totems, images and statues of the new leader Chiang Kai-shek, significant figures from Chinese history, and martyrs who died fighting against the Japanese army. These were installed in public spaces such as parks or school campuses. Wu's (2003) article '*The Rise of Public Art in Taiwan*' notes that in the social context of the post-war period the image of the new leader had a dual political function: both stabilising society and declaring the coming of a new era. Moreover, Wu (ibid) also highlights that large sculptures of Buddha were also installed in public spaces by religious organisations during the same period. The recognition and presentation of public art in this period was rooted in the glorification and worship of political and religious idols (see Figure 2-4).

Figure 2-4: The statue of the Former President Chiang Kai-shek of the Republic of China

Nonetheless, the adoption of these new public art forms contributed neither major improvements nor beautification to urban environments. This remained unchanged until the early 1960s when art in public spaces began to embrace a realist view of local Taiwanese elements and lives. In 1961 Shui-Long Yen[3], began promoting the beautification of urban landscapes and was commissioned to produce several mosaic murals for various public spaces. These include: *Sport* in 1964 for National Taiwan Sport University's sports stadium, *Sunrise* (see Figure 2-5) in Jihsin cinema in Taipei since 1966 (Jihsin means 'new days' in Chinese), and *From Agriculture to Industrial Society* (see Figure 2-6) in Chientan park in Taipei since 1969. These works are hailed as the birth of public art in Taiwan (Chou 2009). There were several artists who upheld similar concepts around this period, such as Ying-Feng Yang[4] who promoted the idea of 'Lifescape Sculpture', a concept of beautifying urban environments. Although public art began to incorporate living elements of the general public and was no longer limited to political or religious figures, conventional sculpture remained the dominant medium for artistic presentation in public spaces and mainly functioned as environmental decoration.

Figure 2-5: Yen's *Sunrise* at Showtime Cinema, Taipei (it is called the Jihsin Cinema in Chinese)

Figure 2-6: Yen's *From Agriculture to Industrial Society* at Chientan Park, Taipei

[3] "Yen Shui-Long is considered to be one of the first generation of modern Taiwanese artists. He was trained in Japan and France in the twenties and early thirties" (Yen 2000).

[4] Yang completed his professional fine art training at Tokyo National University of Fine Arts in 1940s. "In the '90s, he received the 2nd "International Peace and Culture Award", and also took part in many international exhibitions, such as "Overseas Retrospective Exhibition" in Singapore, "Art Basel-Miami Beach" in America, the "International Contemporary Art Exhibition" in Yokohama, Japan, and the "International Contemporary Art Fair" in Paris" (Center for the Humanities 2010).

2.4 The Evolution of Public Art Policy

Three years after the Kuomintang government moved to Taiwan from China in 1949, the U.S. began providing aid[5] (mainly financial) to Taiwan. This aid continued for over a decade until 1965, indirectly influencing the concept and presentation of public art and further inspiring the drafting of initial public art policies in Taiwan. Wu (2003):

> During the U.S. Aid period, large amounts of information and various magazines crowded into Taipei, the exotic culture stimulated waves of artistic talent to study abroad [such as Huang, Yen and Yang mentioned above], R.C. buildings became the mainstream, the combination of architecture and relief were tremendously popular, […] since then public art in Taiwan has become more diversified, experimental and an international style has gradually appeared (translated from Chinese).

US aid triggered economic development, construction and a free flow of foreign information. This openness was augmented by the government's termination of martial law in 1987. The changing political climate dramatically raised awareness of democracy and cosmopolitan culture. Since the end of martial law, statues of Chiang Kai-shek have been gradually disappeared from public spaces, and these spaces have been reclaimed by the community. This period of social and political change also led people to aspire to create better living environments. Public art played an important role in this process (Ni 1997 p.12). This initially indirect influence of U.S. aid on the presentation of public art has had substantial long term ramifications.

In 1986, a popular Taiwanese art magazine 'Lion Art' (1986, p.68) (suspended publication in 1996) raised a discussion of the '1% Art Funding Scheme'. This was a US governmental policy devised to enhance quality of living environments and support art practises, originally inspired

by President Roosevelt's 'New Deal cultural programs' in the 1930s. In 1934 Art-in-Architecture (hereafter A-i-A) laid the foundation for the program when Edward Bruce recommended one percent of new federal building budgets be set aside to commission art. This recommendation was enacted and first appeared within A-i-A's inscription in 1963 (Knight 2008 pp. 3-8). In 1991 the British Arts Council also advocated an adaptation of this policy in their 'Percent for Art', drafting guidelines for the commissioning of public art. These guidelines were subsequently adopted as the standard for overseeing and promoting public art projects. Other European countries such as the Netherlands and Sweden have applied similar policies to purchasing or commissioning art (Malcolm 1997). Despite 'Lion Art' introducing this western concept years ago, the Taiwanese government only acknowledged its importance in 1990, promoting and organising a series of art and environment related events and seminars (Chou 2009). This heralded the first government policy on public art: the 'Culture and Arts Reward Act' of 1992 (hereafter the 'Arts Act') which incorporates a 'Percent for Art' clause in the Article 9[6] (see Appendix v, p.90).

[5] U.S. aid to Taiwan began in 1951 and was terminated in 1965 (aid was given to the Republic of China on the mainland prior to 1951, but at that time Taiwan was a colony of Japan and so did not receive U.S. aid). "It provided more than $1.5 billion in nonmilitary assistance. The aid supported educational programs, including assistance to primary, secondary, higher, professional, vocational, science, and overseas Chinese education, plus educational administration development, amounted to more than $40 million" (Fu 2006).

[6] "The owners, managers or users of [major] buildings used by the public shall be awarded if they install artworks to beautify the buildings and environment, and if the value of such artworks is more than one percent of the cost for constructing such buildings. The enforcement rules for such awards shall be prescribed by the competent authority " (Taiwan Public Art 2002).

2.5 Promotion and Implementation

The government's primary focus on developing the economy and public infrastructure considerably facilitated GDP growth and the creation of a more open society. However, various issues arose due to the primarily economic rather than social focus of these policies, such as juvenile delinquency, frequent protest, illegal gambling and soaring housing prices. Such issues were often attributed to a lack of spiritual and cultural substance within society as the cities were filled with cold and dreary concrete buildings (Ni 1992 and Chou 2009). The 'Arts Act' played an important role in revitalising visual culture by promoting environmental beatification. These changes also encouraged artistic practises by financially supporting artists and art practitioners. The CCA's (Council for Culture Affair) (2002) official website makes explicit the purpose of the 'Article 9 of the Culture and Arts Reward Act', stating: "this Act has been enacted to foster cultural and arts-related enterprises, to provide assistance to cultural and artistic activities, to safeguard the livelihoods of cultural and arts workers." This policy of supporting artists can be traced back to A-i-A's 'Percent for Art', which specified that up to one and a half percent of the total construction cost assigned to new federal buildings should be allocated and used to purchase art crafts from American artists (Knight 2008). The British Arts Council also stipulated a similar regulation, "to create employment for artists, craftspeople, fabricators, suppliers, manufacturers of materials and transports" within their Percent for Art Review in 1991 (Malcolm 1997 p.66).

Two years after the introduction of the 'Arts Act' in Taiwan the CCA selected nine locations from a survey of over 60 sites across Taiwan for a 'Public Art Installation (Experimental) and Implementation Project' (Lin 1999). This was the first time the government had commissioned artists to create artworks in accordance with 'Article 9 of the Arts Act' (see Appendix v, p.90). By reflecting local features and facilitating relationships between the artwork and residents, at least three public participatory events were conducted during each project. This participatory

element was one of the most distinctive features of these nine experimental public art projects. Public participation was unequivocally required in the contract as an essential criterion for examination of these nine public art projects. Thus, each project involved different forms of participation, taking local residents' opinions into consideration for either the selections or development of the artworks. For instance for *Trace of the Bamboo Henge* (see Figure 2-7) at the Hsinchu City Cultural Centre, the centre ran a series of seminars and events during the artwork's design, selection and installation. These seminars discussed and explained the ideas behind and presentation of the artworks, complemented by events such as lazurite[7] mosaic workshop. A similar process of consultation took place for *Love me Chiayi* (see Figure 2-8) at the musical hall square of the Chiayi Cultural Affairs Bureau. The artist taught pupils from a local elementary school to create mosaic artworks based on their perceptions of their hometown (Chiayi city). These mosaics eventually became a part of the three artworks which are still installed at the site.

Figure 2-7: *Trace of the Bamboo Henge* at the Hsinchu City Cultural Centre

Figure 2-8: *Love me Chiayi* at the musical hall square of the Chiayi Cultural Affairs Bureau

The presentation of public artwork in the mid-1990s was, by and large, different from the previous decades, departing from glorification of idols, foci of worship and realistic depictions of the livelihood of people in specific places. More abstract forms of public art emerged while the concept of site-specific art and public participation gradually evolved. Art presentations became increasingly concerned with reflecting local features and with public perceptions of the artwork. Kwon (2004 p.11) explains Rosalyn Deutsche's concept of 'site specificity' as follows: "site-specific art, whether interruptive or assimilative, gave itself up to its environment context, being formally determined or directed by it." The execution of the nine experimental public art projects selected by the CCA established a precedent for future design and installation of public art. Furthermore it led to the establishment of a subsequently important public art law: 'Regulations Governing the Installation of Public Artwork' (hereafter 'Regulation of Public Art') in 1988, an extension law derived from the 'Article 9 of the Arts Act'. The 'Regulations of Public Art' prescribed guidelines for the design and examination of artworks (see Appendix v,

p.100). These guidelines covered methods of artwork solicitation, and the formation of artwork selection committees, alongside providing basic criteria for artwork examination.

Initially the concepts and regulations on public art from western countries were not suitable in Taiwan's public art ecology, with numerous issues arising in the first decade of the new public art policies. For instance, Chou and Chen in their article '*A Discussion on Public art Policy in Taiwan*' (Huang 2008) discussed that the original intention of the policies was to enhance living environments and support art practitioners, however it also prompted a dramatic increase in poor quality statues, replicas and installations. Consequentially the term 'Public Art' became associated with substandard works that ruined public environments. Some of these replicas still survive in Taiwan. For example a few giant dinosaur sculptures are still on display at Hong Lu Di, a religious site and tourist spot in the Zhonghe District, New Taipei City (see Figure 2-9). These replicas barely incorporate the most tenuous connection to their context.

Below is a reorganised list of factors for this overproduction of substandard works, originally presented by Wu (2003): 1) An immaturity in the conception of public art 2) a shortage of professional public art practitioners and 3) decoration of public environments being mistakenly presented as public art. In many cases construction contractors would obtain licenses by fulfilling the basic requirements of 'Percent for Art', through incorporating statues, in their planning applications, often of poor quality and unrelated to local surroundings. Such naïve implementation of the principles of an informed public art policy not only failed to take account of public perception of these new artworks, but also frequently triggered controversies. These pieces or statues were often ultimately removed from the sites where they were displayed.

Figure 2-9: a real size dinosaur sculpture at Hong Lu Di, a religious site in New Taipei city

In 1999 a replica of *The Awakening*[8] (originally by J. Seward Johnson), a typical example of these ill thought through public art projects, was displayed in Rose Park, Sanchong District in New Taipei City. The piece was eventually removed at the request of local residents as it triggered an unwanted association with an air disaster that happened at Taoyuan, Taiwan the year before in 1998. This highlights the issues incurred by replica pieces arbitrarily displayed in public spaces without consideration of its impact on the environment. It also reiterates the importance of communication with the people who live in the area where the artwork is intended to be installed. *Tilted Arc* by Richard Serra, installed at Federal Plaza, New York, also highlights this issue of community reception. Although *Tilted Arc* was not a replica and was in effect a site specific piece (Kwon 2004), there was a lack of communication with people who frequented the area and there was opposition to its installation. Some immigrants to the area opposed it as it evoked painful memories of the 'iron curtain' (Senie 2002 p.45), and the piece was ultimately dismantled in 1989. The removal turned out to be controversial as the GSA[9] (General Services Administration) were unable to prove that it was solely motivated by respect

for the views of local residents (Knight 2008 pp.8-14). These two examples underline the significance of public participation in the implementation of public art projects, as their final presentations can have unforeseen effects on local populations based on personal and local interpretations of the works. Although artists may not always seek positive feedback from their audiences, public reception of an artist's work can affect the audience's willingness to understand the piece or explore the artist's original intent. This issue applies to all art forms intended to be presented in a public context. Since this research focuses on interactive artwork displayed in public spaces, this issue of public reception and the need for early consultation in planning public art will be dissected further in subsequent chapters.

[7] Lazurite (color glass) is a traditional industry in the Hsinchu area, Taiwan.

[8] The Awakening created by J. Seward Johnson, as "a five piece cast iron sculpture depicting the arousing of a bearded giant with a head, hand, outstretched arm, bent knee and foot arranged to suggest that the giant is breaking free from the earth" (Cooper 2008).

[9] GSA (General Services Administration), the agency which oversees all federal construction projects.

2.6 From Lawfully Forced Involvement to Active Participation

Public participation in the nine experimental public projects mentioned above was implemented in accordance with the 'Arts Act' and the 'Regulations of Public Art'. In fact, another government body, the Department of Rapid Transit Systems of Taipei City Government (hereafter DORTS), began promoting public art before the 'Arts Act' was legislated. DORTS also employed 'public participation' in their first experimental public art project *Dawning Sail* (see Figure 2-10) at Shuanglian MRT station in 1993. During the artwork soliciting phase DORTS invited the head of each neighborhood MRT station on the Danshui line (the first MRT line) to participate in an artwork selection committee. Although the invitations were mostly declined (Ni 1997 p.12), the move informed the incorporation of public participation in future public art projects. Different strategies were adopted in future, such as inviting people to take a part in creative art-based activities rather than listening to didactic presentations on possible versions of a future artwork.

Figure 2-10: *Drawing Sail* at Shuanglian MRT station, Taipei

The participatory practise (public participation) of this period mainly promoted the concepts, benefits and the importance of public art. This was conducted by inviting local residents to take part in discussions on artwork installations, fostering familiarisation with the artists' ideas, and occasionally by inviting local residents to participate in the creative processes. Despite this, many of the final presentations of artworks were often sculptures or static installations. Miles (1997 p.164) states that "conventional public art, as commissioned through 'Percent for Art' policies, tends to be defined by its relation as artistic object to a physical site." Indeed this concept has gradually shifted since more dynamic, foreign notions were injected into the public art field through various seminar like events, which expanded the understanding of public art. One of the earliest such events was 'the Symposium on the Environment and Arts,' run by the Foundation for Research on Open Space, Taipei, in 1993. Rita Roosevelt from the American art institute was invited to the symposium. Roosevelt (cite in Ni 1997 p. 49) stated that: "the form of public art has to include any medium, materials or mixed medium to create visual art, while it can either be movable or fixed (re-translated from a Chinese translation of her presentation)." Such events have since become frequent occurrences: for instance, in 1998, Tomo Suzuki (Suzuki 1998), a Japanese independent curator was invited to the International Symposium on Public Art. Suzuki pointed out that "public space, especially outdoor public space such as street, park and plaza, are a place for everybody". In 2005 Mary Jane Jacob, an independent curator was invited to give a presentation in the public art symposium on: 'Rethinking the Public in Public Art'; in which she argued that "The relationship or exchange between the artwork and its audience must be an open and generous one" (Jacob 2005).

Several revisions of the 'Regulations of Public Art' in 2002, 2003 and 2008 reflect the process of review, experimentation and apprehension of new concepts from external sources that has shaped public art in Taiwan. The course of these revisions shows that the concept of public art in Taiwan has shifted from the 'Installation of Artwork' to the 'Installation of Public Art' and

subsequently to the ‘Implementation Plan for Public Art’. There is now a relatively clear understanding of the planning and implementation necessary for public art projects in Taiwan. Although the changes in wording of the act may seem minor revisions, they have had a significant impact in the field: the concept of public art is no longer restrained to an object concept of artwork. Moreover the addition of the word ‘public’ to the ‘Regulations of Public Art’ not only reaffirms the significance of the public opinion on the execution of public art projects but, more importantly, allows a more flexible presentation of artworks. This includes inviting and encouraging ‘public art’, where it is implied that the audience is a part of the art expressing and voicing their thoughts or social issues. Chou and Chen (Huang 2008 p.23) remarked that public art “has transcended superficial environmental beautification and instead come to represent the construction of an inner social truth and physical expression of the spirit of a place.” The shift in concept has widened public art practises and new public art forms have appeared that resonate with Suzanne Lacy’s ‘New Genre of Public Art’. Its origins can be traced back to ‘Happenings’ from the 1960s: a performance art genre in which, while the narrative of art is often preplanned, improvisation and audience participation are essential. The New Genre Public Art extends this principle, departing from the conventional public art concept which emphasises the more socially engaged and conscious. This ‘New Genre Public Art’ “is process-based, frequently ephemeral, often related to local rather than global narrative, and politicized” (Malcolm 1997 p.164).

In 2004, Taipei City Government’s Department of Cultural Affairs ran a public art event: ‘Taipei on the Move’, part of the annual ‘City on the Move Festival’ (since 2004). ‘New Genre Public art’ was the core of this year’s event. Artists from America, Holland, Finland and Taiwan were invited to participate, each artists devising a thematic workshop relating to issues that concerned them as individuals and society at large. They focused their attention on issues and communities in Taipei including: the young, senior citizens, the general public as a whole, and gender issues.

Suzanne Lacy was one of the artists invited to participate carrying out a workshop *TEAM: i_d_entity* (see Figure 2-11) to explore the ubiquitous influence of the Internet on the younger generation. In order to understand the issues young people encountered in a local context, Lacy and the rest of collaborative artists began by conducting online discussions with ten anonymous university students (from Fu Jen Catholic University) for one hour per day for around six weeks. In the second phase Lacy flew to Taipei together with the other artists and they invited approximately 160 students (participants) from ten local universities to take part in a face-to-face meeting at a grassy park in the Xinyi District in Taipei city. The students were engaged and freely participated in discussions based on preplanned topics. However, none of the students gave the answers Lacy and the other artists had predicted. This workshop created opportunities for young people to share their individual experiences and thoughts, and to discuss issues about their society, and share creative ideas.

One of the workshops under 'Taipei on the Move' was *The Empress's New Clothes* (see Figure 2-12) run by local artist Mali Wu and her stitching sisters (the participants in the workshop). Wu completed her postgraduate degree at the National Art Academy, Dusseldorf, Germany and returned to Taiwan in 1985. In the workshop Wu encouraged the all female participants, to share their life experiences, fantasies and thoughts. Wu subsequently led the participants to manifest their thoughts, putting into practise what they had learned by designing and sewing clothes which expressed their personal feelings. After completing their creative garments the participants demonstrated their fancy clothes at the Taipei Fine-Art museum, in the streets, and in traditional markets making such public spaces their stages and catwalks. 'Taipei on the Move' was by no means unique, several such participatory public art events and festivals are held across Taiwan periodically. For example, 'Peninsula Arts Festival' (since 2000) in PingTung, in southern Taiwan, and 'Art as Environments: a Culture Action on Tropic of Cancer' (since 2005) in Chaiyi, near central Taiwan.

Figure 2-11: *TEAM: i_d_entity* (courtesy of Department of Cultural Affairs, Taipei)

Figure 2-12: *The Empress's New Clothes* in the street, courtesy of the artist (Mali Wu)

2.7 Computer Based Interactive Art in Public Spaces

In addition to becoming more dynamic and displaying higher aesthetic standards, public art in Taiwan has become more concerned with relating to people, both through artworks and the selection of suitable locations. Artistic practise is increasingly focusing on public participation, social engagement and empowerment. This has not only fermented within the New Public Art genre discussed above, but has also become commonplace within other art forms exhibited in public spaces, such as computer-based interactive art. In the book '*New Media Reader*' Manovich (Wardrip-Fruin and Montfort 2003 p.23) points out that "a number of writers such as Soke Dinkla have argued that interactive computer art (from 1980s on) further develops ideas already contained in the new art of 1960s (happenings, performances, installation): active participation of the audience, an artwork as temporal process rather than as a fixed object, an artwork as an open system." This argument illustrates the convergence of New Public Art and computer-based interactive art, as both emphasize 'active participation of the audience' as a means to reveal the essence of the art.

High-tech industries are prospering in Taiwan, through local companies such as Acer, Asus, and HTC and international companies basing themselves on the island. While knowledge and skills in this field are relatively freely available, computer-based interactive artwork and other types of electronic artwork have only appeared in public spaces as permanent installations since the late 1990s. Initially there was concern over limitations to funding and the maintenance difficulties for such artworks (Yuan 2005). The first 'interactive installation' displayed in a public space (Gungguan MRT station) in Taiwan was *Peep* in 1999 by Sui-Ying Tsai. *Peep* has two parts to it, one inside the station and one outside, the first part consists of three circular-shaped screens installed beneath the ceiling inside the station (see Figure 2-13). The images displayed on the three screens are projected from the station platform. The second part, located outside, is made up of LED panels and cameras fitted inside three cylinder shaped objects (see Appendix i,

Figures 2-3) outside exit seven. These cylinders allow people from outside, the peepers, to watch the images from inside the station. Meanwhile the peepers' image is also captured and projected onto the screen inside the station. Yuan (2005 p.15) argues "In the field of media art, interactivity has a different meaning than in traditional usage […], a work of interactivity requires the intervention of the viewer to become complete" (translated from Chinese). The interactive mechanism of this art piece is preset, while the realisation of art relies upon the participants who interact with it. In this type of artwork the participants are indispensable in revealing the meaning of and embodying the art.

Figure 2-13: *Peep* at Gungguan MRT station, Taipei

Perhaps due to improvements in maintenance techniques for computer based artwork, new interactive artworks have been installed in open public spaces every year over the past decade. For instance, *Fast or Slow*[10] (see Figure 2-14) by Japanese artist Koichiro Miura and *Our Personal Public Art*[11] (see Figure 2-15) by local artist Hsin-Chien Huang (DORTS 2011) both have been newly revealed to the public in early 2011 in Taipei MRT Nangang Exhibition Center Station. These two computer-based interactive artworks were selected to be exhibited at the

station due their strong potential to reflect the features of the surrounding high tech business district of Nangang Software Park. The technologies used in creating these two installations are not unprecedented: similar technologies have been employed in other interactive creations such as *Bijlmer Moodwall*[12] by Studio Klink (Klink 2009) in Amsterdam. The presentation of *Bijlmer Moodwall* is akin to *Fast or Slow*. *Our Personal Public Art* adopted similar interactive techniques as *Infiniti Interactive Mirrors*[13] an interactive installation by George P. Johnson et al (Infiniti 2006) in America.

Figure 2-14: *Fast or Slow* at Taipei Nangang Exhibition Center Station

Since computer and electronic devices are increasingly accessible, it seems maintenance is no longer a pressing issue within a mature technological environment. The kinds of artworks discussed above have become a prevalent art form for display in public spaces in Taiwan. However, although dazzling multimedia effects have the potential to be a stimulus to raise sensory attention and subsequent active participation, effects alone may prove insufficient to convey artistic intents or trigger responses. Hence an appropriate analytical framework will be

crucial in facilitating interactivity between participants and artworks in future works in this field. The development and applications of said framework will be discussed further in the following chapters of this research.

Figure 2-15: *Our Personal Public Art* at Taipei Nangang Exhibition Center Station

[10] "The work *Fast or Slow* consists of sheets of anodized aluminum panels and light panels controlled by motion sensor units located on the surface of two walls. Its central theme is a mental and physical stimulus through a simple interactive experience" (DORTS 2011).

[11] This interactive mirror is an online blog and the content of it is currently contributed to by 18 artists from different art practises. The passengers can see the frequent changes in artworks displayed by the mirror, and if the passengers see work which they like, they can express their approval by touching the frame besides the mirror, which is similar to pressing the icon 'like this item' on Facebook. The passengers can also register as artists (at http://www.publicart.tw) and contribute their works to the mirror, sharing them with other passengers in the station.

[12] The Moodwall [a 24 meter long interactive light installation in Amsterdam] is situated in a pedestrian tunnel and interacts with people passing by, improving the atmosphere in the tunnel and making people happy and feel less unsafe. (Christian Saucedo 2009)

[13] Infiniti Interactive Mirrors is an interactive new media installation allowing visitors to learn about the brand (Infiniti) and vehicles; they were highlighted by the Interactive Mirrors. (Infiniti 2006)

2.8 Summary

From the experience of the relatively closed and conservative colonial periods to the current open and democratic social environment, art presented in public spaces has ebbed and flowed in Taiwan. The roots of these art forms often intertwine with politics, foreign concepts, social status and trends in business, thus attempts to dissect each form of public art by identifying its origins and impact on society merits serious further research. As this study is focused on the processes of interactivity leading to meaningful experience in MRT stations, it is beyond the scope of this study to explore all the possible research questions that arise from an outline of the development of public art.

Nonetheless, this chapter has explored the broad context of public art's transformation and development in Taiwan. It has examined both conceptual aspects and physical presentation, from glorification of idols to religious worship, from environmental beautification to the involvement of people in dialogue as forms of public participation, finally arriving at a discussion of the relatively dynamic current participatory practises. This discussion facilitates understanding of the evolution of origin and concepts of public art in Taiwan and how it arrived at its current state.

Indeed, changes in public art policies and concepts have widened in tandem with the continuum of change in public art forms. Art implementation of permanent installations and ephemeral performances in open spaces demands a certain degree of 'public' substance: participation, consciousness and response. This is the case regardless of legal requirements or an artists' self-consciousness. Traditionally, public art has differed slightly in emphasis, placing increasing value on richness of aesthetic texture, and concurrently blending the work with the adjacent environment (site-specific). These two notions have gradually become internalised and combined as fundamental principles for pursuing an ideal public art implementation and installation in Taiwan.

Chapter Three — Rationale behind the Selection of the Three Case Studies

3.1 Introduction

Prior to formally undertaking the examination of interactivity, it is essential to demarcate the realm where the experience takes place. This chapter comprises of three main sections. The first section introduces the Taipei and Kaohsiung MRT networks, exploring the nature of, and activity within, the space and also presenting the chronology of the development of MRT artwork. The second section furthers the survey of computer and electronic based artworks presented in the MRT space. This leads to the final section which discusses the rationale behind the selection of the three case studies.

Overview of the MRT Space

The Taipei and Kaohsiung MRT systems are relatively new compared to other underground systems around the world. The Taipei MRT system opened in 1996, and as of 19 July 2010 there were 82 fully functioning stations, with several new routes nearing completion. For example, the Luzhou, Sanchong and Xinzhung lines are anticipated to become fully operational before the end of 2012. In the meantime, numerous new routes have been approved or are under construction[1]. People in Taipei were initially concerned about the security and performance of the MRT system, however, it is now the primary mode of public transportation in the city. There are approximately 1.2 million people taking the MRT each day. It is estimated that the average daily transport capacity will increase to more than 3.6 million when the comprehensive MRT network is complete[1].

[1] The development of the Taipei MRT network is divided into three major stages:
Stage1: Completion of most of the initial network and substantial upgrading of service capacity on the Taipei MRT
Stage 2: Applying for further budgets and continuing the construction of approved MRT lines
Stage 3: Continuous planning and construction of an extended MRT network
(DORTS 2010a)

The Kaohsiung MRT on the other hand has been running for just two and a half years. As of 19 July 2010 there were 37[2] fully operational stations located on the west-east and north-south lines that traverse Kaohsiung city and county. The Kaohsiung MRT has a relatively low average of 120,000 trips being made each day[3]. This low usage was also experienced in Taipei initially, and as the Kaohsiung MRT system is still fairly new the current concerns may be overcome as they have been in Taipei. Teething problems include a lack of both public parking spaces around MRT premises and shuttle bus services connecting stations with important locations around the area. It is perhaps an even bigger issue that people in Kaohsiung are accustomed to travelling by their own transport and are not fully aware of the benefits of public transportation. Nevertheless, based on the experience of the Taipei MRT, as well as other newly developed underground systems in the world, these issues are expected to gradually ease, particularly after extension of the network anticipated to be achieved before 2020[4].

[2] The number of operational stations was confirmed in writing from email correspondence with the director of Kaohsiung Mass Rapid Transit on 19 July 2010

[3] In comparison with the statistics from the same period last year, the number of passengers has increased 4.93% from 118,075 to 123,890 (KRTC 2010).

[4] Kaohsiung metropolitan metro system long-term construction plan (KMRT 2010)

The Passengers within the MRT Space

Harriet F. Senie has noted that (McClellan 2003 p.185) “Most public art slips into the urban-scape without a ripple, often ignored by its immediate audience or used according to their everyday needs.”

Indifference towards artworks exhibited outside the walls of art galleries and museums seems to be a common phenomenon, prevalent in particular in spaces such as transportation hubs. During field studies, the majority of the research participants said they would not usually pay much attention to artworks in the MRT stations unless they had free time. In my observations, it was clear on most occasions that the passengers were walking straight past the artworks. People in this transient space seem to not spontaneously seek art experiences. This may result from the nature of the space, its primary function being travel. Knight asserts that (2008 p.87) “People usually encounter public art by accident; one rarely goes to a subway station for an art experience, but rather happens upon it while waiting for the train.” For instance, the two parts of the artwork *Time-Splinter* and *86400* (see Appendix i, Figures 11-12) are displayed in two exhibition halls consisting of two rooms segregated from the concourse of Yongning station. The idea here might be to create an artistic ambience inside the station allowing passengers to appreciate the works of art in independent spaces. However, based on my field observations at the station, the artworks placed in the exhibition halls seemed to struggle to attract the attention of the passengers. Very few people were seen entering the exhibition halls and, much of the time, they were just looking for a quiet space to talk on their mobile phones. This outcome bluntly reveals the nature of activity in the space. Miles (1989 p.79) asserts “the experience in the gallery is uneasily transported to the street, using architecture or landscape as the ‘wall’ on which to ‘hang’ the art”. This statement supports evidence from observation of people’s activities in the MRT spaces, where the imminent presence of an artwork is often ignored. People rarely wander in this space, instead they often rush towards their destinations. The nature of the passengers is fundamentally

different to the museumgoer. In an analysis of the challenges posed in the presentation of art in public spaces (bus transit stop in Tempe, Arizona) Birchfield et al (2006) points out that, “audiences will not be bound by expectations of traditional venues.”

Figure 3-1: The left arrow points to the exhibition hall, Yongning MRT station

Figure 3-2: The exhibition hall and the station concourse, Yongning MRT station

Over the last decade, this reaction has gradually changed, since MRT stations have become major public venues in Taipei city as the network has become more widespread. It has been optimistically predicted that the experience in Taipei will also occur in the Kaohsiung MRT. Several stations in both MRT systems have been built as leisure spaces where people can spend time with their families and friends, e.g. Taipei Main and Xiaobitan stations. While in many stations, such as Taipei Banqiao, Zhongshan, Zhongxiao Dunhua and Kaohsiung Formosa Boulevard MRT, part of their space has been utilised for diverse purposes such as for temporary art exhibitions and for students to practise dancing or art performances. These turn the once mono-functional stations into multipurpose spaces, which offer new and alternative experiences for the commuters. This, to some extent alters people's stereotypical view of these transient spaces. However the immediate experience of the space by the passengers has not dramatically changed. The MRT is valued, but there is still limited awareness of the public art it incorporates, a sentiment reflected by Miles (1997 p.132) who remarks "public transport is seen as a social 'good' available to most members of an urban society".

Exploring the significance of the passengers' experience, I asked Yin, an engineer from DORTS (see Glossary, p.xv) *to what extent the passengers' perceptions and sensory experiences of artworks in the station are considered during the artworks planning period?* Yin replied:

> We do not tend to prefer avant-garde artworks that may extremely subvert visual experience, as it is different to curating art exhibitions in art galleries or museums. It is very important to take the general public into account. It should be noted that many sensitive topics are untouchable, for instance, religion, sex and violence because these could potentially trigger negative responses from people. Therefore it is explicitly forbidden to present such subjects in the stations (translated from Chinese).

These observations, reviews of the literature and dialogues, are insufficient to fully describe the passengers' behavioral patterns within the space. However, the points mentioned emphasise the importance of understanding the nature of the space, the passengers and the ways in which art presentations should be tailored to these two factors.

3.2 The Introduction of Art into the MRT Space

> DORTS (see Glossary, p.xv) has been working on introducing artworks into MRT spaces since 1990. In 1991, DORTS invited scholars and experts to a symposium titled the 'Implementation Plan for the Integration of MRT Construction and Arts.' The following year, DORTS established a special project on MRT public art. The goals of the project were to enhance the quality of MRT space, strengthen the local context of stations, and encourage a feeling of intimacy towards MRT construction [5] (DORTS 2010b).

Such activities by DORTS illustrate that the presentation of art to improve overall experience of MRT space has long been an important strategy for encouraging people to use the MRT system. Consequently, each station has been built with different qualities to make them either aesthetically pleasing, or to give them unique contextual values. Various types of artwork have been exhibited in both MRT networks, creating a whole new role for the stations akin to open public galleries. In some cases the stations themselves have been created as large works of art (see Figure 3-3). Although the awareness of art and its important role within the MRT spaces has been raised since the 1990s, artworks have only recently been incorporated into the early stages of MRT station planning. For example in Taipei's Xinzhuang Line artwork has only recently been included in the planning process. The line is expected to be completed in 2013.

[5] The Chronology of Taipei MRT artwork planning, introduction and installation (DORTS 2010b)

Figure 3-3: *Dome of Light* in the concourse of Formosa Boulevard Station, Kaohsiung MRT

During interview, Yin, the engineer from DORTS, was asked: *At what stage is the planning of an artwork adopted into the construction of the MRT stations, and what are the major considerations?*' Yin replied:

> At the very beginning we were rushing to set up artworks before opening the stations. The time for designing and installing the artworks was very tight and rushed. However, after the trial run period of the Xinzhuang Line, we started to involve professional art planners to work with the engineering and construction teams. The planners were required to have an art background and their job was to sketch out art spaces in the earlier stages of station construction. Additionally, the planners had to possess knowledge of design and have the capability to lay out artistic themes for the stations, for example, they have to decide whether or not to make walls, floors or chairs for the art installations. Moreover, the planners were also responsible for the initial stage of artwork selection. The artworks that were suggested by the planners were subsequently examined by the MRT public art

selection committee. Once the art planners became involved the timing for the installation of artworks was extended to at least one year before undertaking the interior design of the stations. This allowed sufficient time if anything else needed to be modified in the later stages, while many issues could be settled beforehand.

Nevertheless, based on the Los Angeles Metro experience, we are now inclined to move a step forward; to include artists in the early detailed designing period rather than art planners, as we have found that the planners were only able to reserve the spaces for the artists whereas the artists could start work as soon as they entered the space. In the meantime they can have direct contact and opportunities to discuss details with the architects. However, the policy of early involvement of art planners within the early construction period has already substantially reduced the building budget. For example, in the experience of the construction of the Danshui line (the first route of Taipei MRT), building materials were ordered but because of the late involvement of artwork design, some of the materials could not be used. Furthermore, some facilities were already built but had to be removed or relocated to other places, which often resulted in increases in the cost (translated from Chinese).

This dialogue suggests that earlier involvement of artists or art planners within the station construction or designing process increases cost efficiency while allowing for a freer creative process and presentation in the spaces.

3.3 Forming Selection Committee and Artwork Selection Criteria

As previously discussed in Chapter 2, the implementation of public art projects in Taiwan is bound by two major pieces of legislation; the Arts Act and Regulations of Public Artwork (see Glossary, p.xv). In accordance with the Article 9 of the Arts Act, “Publicly-owned buildings shall be fitted with public artworks to beautify them and their surroundings.” The MRT station is undoubtedly a publicly-owned building, thus installations of public artworks into this space must abide by these two laws.

Based on the Regulations of Public Art, two units must be established in implementing each public art project, 1) a Public Art Execution Team and 2) a Public Artwork Reviewing Committee. The Public Art Execution Team is in charge of the holistic implementation of the public art project, including drafting the plan for installation of the artworks, devising the artwork selection criteria and other related responsibilities (see the Article 6 and 7 of the Regulations of Public Art, Appendix v, p.103). The essential work requirements for artwork installations in MRT (Banqiao station (*Poetry on the Move*) and Xiaobitan station (*We are One Family*)) stations are listed as follows in Regulations and Guidelines for Public Art:

4) Works should be created to fit the specific environments of the selected stations and may not have been previously displayed in Taiwan or elsewhere.
5) Works are to be considered additional to the existing furnishings of stations. The installation of artworks may not affect the finished surface or damage the structure of any station.
6) Works should not interfere with the flow of passenger traffic, public safety, control systems, fire prevention and rescue, ventilation, signage, lighting function, etc.
7) The theme of the artwork must correspond to the specific context of each selected station. The work should be presented in an eye-catching, interesting, friendly and relevant manner. Hopefully the public art could generate discussion and attract viewers

[passengers]

8) Material must be fire resistant, durable, able to withstand exposure to the elements and easy to maintain.

(see Appendix v, pp.117-118)

In addition to the five items quoted above, different work requirements are specified for each MRT public art project. These are determined by various factors including: local features, design of the station, location of installations (inside or outside the station), and budgets (see Appendix v, pp.109-118 for the work requirements of the three selected MRT artworks *the Legend of the Phoenix*, *Poetry on the Move* and *We are One Family*). The major responsibility for the Public Artwork Reviewing Committee includes: reviewing artworks under consideration of installation in the MRT stations, and offering professional consultation on and assistance with the installation of artworks. The required composition of these two units are also stipulated in the Article 2 to 9 of the 'Regulations of Public Art' (see Appendix v, p.100), which requires a mix of different skills in applied art, art criticism, architecture, and urban and landscape design.

Apart from the artwork selection criteria and the works requirements, there are four ways of soliciting artworks 1) Open solicitation, 2) Invitation for completion, 3) Delegation of creation and 4) Evaluation and purchase (see Appendix v, p.104). These four approaches have their advantages and disadvantages. For example, the first and second approaches are fairer soliciting methods and help diversify works up for selection. However, they are relatively time consuming and require more funding for promulgation and awards. The third and fourth approaches are more time efficient and the artworks are of a more consistent quality. However, as there are fewer works to choose from there is less diversity of designs. As there is a smaller pool of artists to draw from, the whole process will take much longer if the artists have to be replaced. These four soliciting methods have been adopted based on the different features of buildings, varied localities and different funding structures.

3.4 Interactive and Electronic Artworks within the MRT Space

Various types of permanent artworks are exhibited within both MRT networks. Currently, in Taipei MRT there are 42 art pieces displayed in different stations. The number will increase to 45 pieces before the end of 2011[6], while in Kaohsiung there are 37 artworks exhibited in the MRT stations[6]. The artworks exhibited in both MRT networks represent and highlight local and regional features, providing ample research opportunities. The on-site element of this research began with a broad survey of the space, with a particular focus on the interactive and electronic based art installations. This was intended to help select suitable artworks for the case studies. Along with the selection process, several informal periods of observation of passenger behavior were carried out. The table 'Computer- Based Interactive & Electronic Artworks at Taipei and Kaohsiung MRT stations' (see Figure 3-4) illustrates the number of interactive and electronic art installation installed into the MRT premises, and the regularity with which they have been selected. The brief artwork descriptions listed below the table are based on my personal observations during numerous field studies at different stages of the research (for large photo documents of the artworks please see Appendix i).

[6] The total number of permanent artworks exhibited in both Taipei and Kaohsiung MRT networks were confirmed by email correspondence with both the directors of Taipei and Kaohsiung Mass Rapid Transit systems on the12th and 19th July 2010.

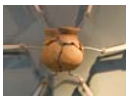
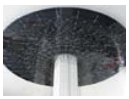
Computer-Based Interactive & Electronic Art Installations — Taipei and Kaohsiung MRT				
Number		**Year**	**Artwork & Station**	**Medium & The MRT Network**
1		1998	*Tree River* Zhongxiao Station	Stainless steel, granite, water and LED light Taipei, MRT
2		1999	*Peep* Gongguan Station	FRP, camera, screen and projector Taipei, MRT
3		2002	*Around* Kunyang Station	Board, motor and sensor Taipei, MRT
4		2004	*We are One Family* Xiaobitan Station	Stainless steel, camera and LED screen Taipei, MRT
5		2005	*Evolution Orbit* Banqiao Station	Colour-coated stainless steel and motor Taipei, MRT
6		2005	*Poetry on the Move* Fuzhong Station	Stainless steel, LED display and software Taipei, MRT
7		2005	*River Romance* Far Eastern Hospital station	Glass and LED light Taipei, MRT
8		2006	*Time – Splinter* Yongning Station	LED light, glass and motor Taipei, MRT
9		2008	*Flying Project & Dream of Flying* Songshan Airport Station	LED light, stainless steel, glass and motor Taipei, MRT
10		2008	*The Sky of Frog* Jiannan Station	Stainless steel, LED light and pc panel Taipei, MRT
11		2010	*BIGPOW* Zhongshan Station	FRP, LED panel and computer Taipei, MRT
12		2008	*The Legend of the Phoenix* Fongshan West Station	Stainless steel, sensor, screen and computer Kaohsiung, MRT
13		2008	*The Dance of Lighting the Universe* Fongshan Station	Copper and light bulb Kaohsiung, MRT

Figure 3-4: Computer- Based Interactive & Electronic Artworks at Taipei and Kaohsiung MRT stations

1) ***Tree River***, (see Appendix i, Figure 1) by Sui-Ying Tsai, is the first electronic artwork in the MRT system in Taipei, installed at Zhongxiao station in 1998. The major element of this artwork is a large LED tree silhouette lit at certain times of the day, alongside which the artwork incorporates an artificial waterfall that runs around the clock. These elements were designed as part of the MRT complex installed outside the station, located at the very centre of one of the busiest and most important traffic arteries in the city. The *Tree River* has been exhibited here for more than a decade.

2) ***Peep***, (For a full description of the artwork see pp.44-45 and Appendix i, Figure 3)

3) ***Around***, (see Appendix i, Figure 4) by CSGROUP, is an interactive installation made up of eighteen carrousel horses built in between tempered glass. The instillation functions as a series of walls separating the interior of the station from the outside. Originally, the carrousel horses would start swinging to a musical accompaniment when people approached them. However, due to maintenance difficulties there were only a few carrousel horses operating, during my observations.

4) ***We are One Family***, (see Appendix i, Figures 5-6) by Very Conception, is the only interactive work out of a total of five art pieces within Xiaobitan MRT station. The installation has two separate input and output sets. The input set is a five scooter handlebar shaped image capturing devices and the output set is a five member family figure sculpture with LED screens fitted on their faces. People's facial images are conveyed onto the screens when they press the red button on the scooter handlebars.

5) ***Evolution Orbit***, (see Appendix i, Figure 7) by Ya-Lun Tao, is a motor driven installation that consists of twelve rotating colorful rings made of aluminum fixed around the eight support

poles on the station platform. However, the rings have been set to rotate for only five minutes per hour, as they make a loud noise when the rotations start. As a result, the rings remain static most of the time.

6) *Poetry on the Move*, (see Appendix i, Figures 8-9) by E-Chen, is an interactive LED bulletin constructed from stainless steel hung beneath the ceiling of the main atrium of Fuzhong station. The installation invites the passengers to send text messages to a displayed number and the messages are then transferred to the LED bulletin. A warning phrase to deter potential malicious utilisation of the installation is also displayed intermittently.

7) *River Romance*, (see Appendix i, Figure 10) by Sen-Chun Yang, is an LED wall installation consisting of fifty hollow glass rods used as covers for an array of LED lamps. The colours of the LED lights vary at different times of the day and slowly move upon the surface of the wall displaying a scene of a flowing river. Poems and narratives of the history of the station's surroundings are engraved on the glass rods, which can be seen when the LED lights glide beneath them.

8) *Time – Splinter*, by Tsung-Chieh Hsu, is made up of two installations; *Time-Splinter* and *86400*. The former is made up of two motor driven installations comprised of identical copies of ancient jars (see Appendix i, Figure 11) that have been installed in two different display windows, located in separate exhibition halls. The jars are recurrently split and then reassembled, operated by six motor driven arms. *86400* is composed of two LED walls (see Appendix i, Figure 12), also placed in two different exhibition halls alongside the jar installations. Each wall consists of 86400 LED lights and each one represents a second of a day. They flow, one by one from one wall to another.

9) *Flying Project* *and* ***Dream of Flying***, by Hong Cheng Chen, are two separate, flight-inspired art installations. The former consists of three human silhouettes placed inside display windows; analogies for time travel. Each of the silhouettes has a different type of flying equipment. The LED lights are fitted behind the wall creating an evoking a sense of the high-tech (see Appendix i, Figure 13). *Dream of Flying* consists of three dream and toy-like aircrafts including a winged bicycle, air balloon canoe and a single propeller-driven flying car. Each of these has motional components driven by motors that move specific parts (see Appendix i, Figure 14).

10) *The Sky of Frog*, by Chien Chen, several different sizes of frog face shaped stainless steel plates are suspended underneath the ceiling. In the day time the mirror-like plates reflect images of people passing underneath and the surrounding city scenery (see Appendix i, Figure 15). At nightfall the blue LED lights installed behind the plates are lit up revealing smiling frog faces, complemented by light changing effects displayed on a pillar that forms the main body of the artwork (see Appendix i, Figure 16).

11) *BIGPOW*, (see Appendix i, Figure 17) by Akibo, is made up of three robot installations displayed just outside the Zhongshan MRT exit R4 in a small park surrounded by an apartment block complex. The installations are equipped with speakers and music input sockets that allow people to connect their MP3 players to the installations. The robots' faces are made from LED screens and their facial expressions change according to the different rhythms of music.

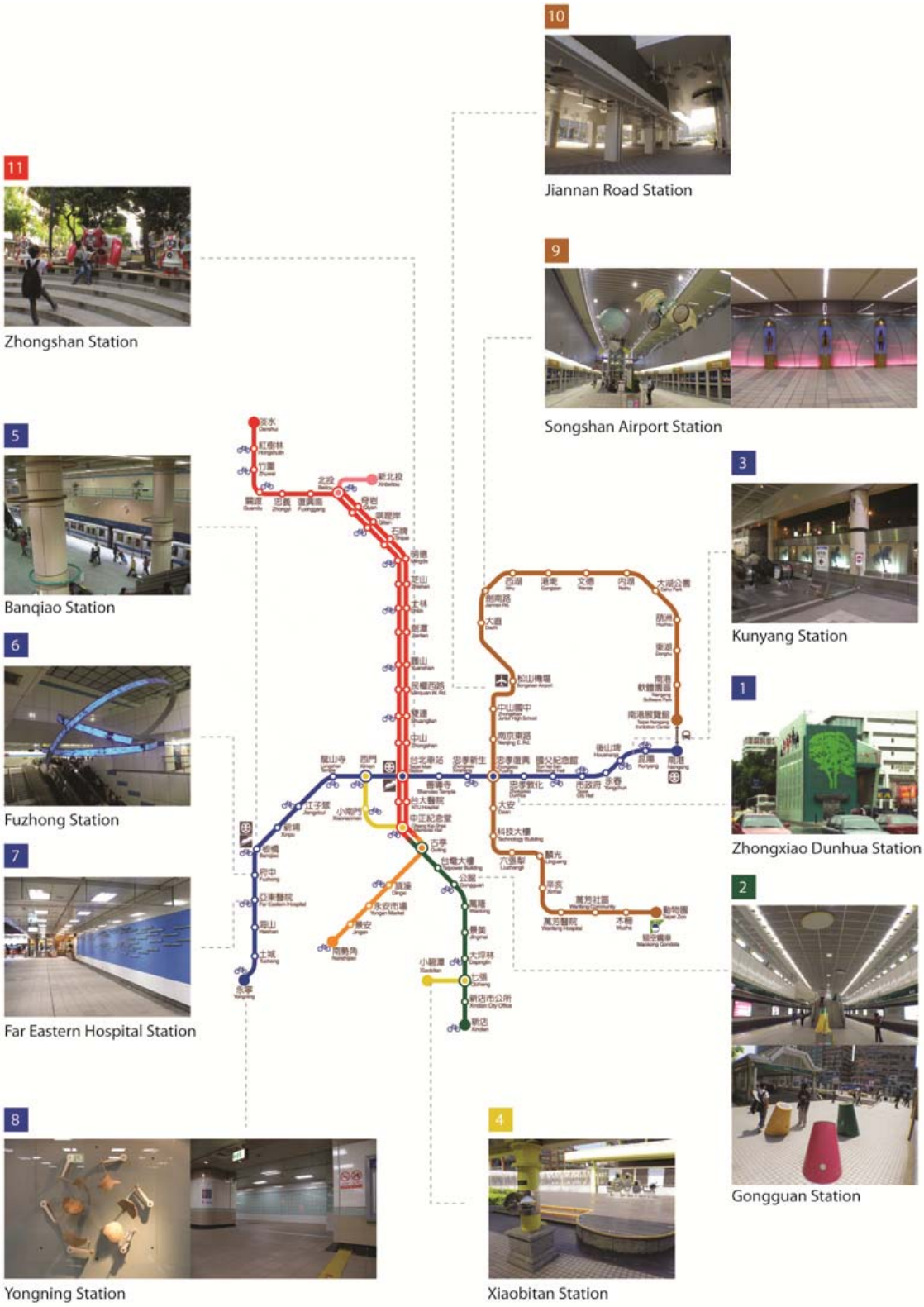


Figure 3-5: Touring map of computer controlled and electronic based artworks in Taipei MRT stations

1) ***The Legend of the Phoenix***, (see Appendix i, Figures 18-19) by Sheng-Chien Hsiao, at the time of writing (July 2010), was the only interactive artwork within Kaohsiung MRT. The phoenix-shaped artwork is made of articulated stainless steel pipes with eight rotating maracas attached to the ends of the pipes. It is suspended beneath the ceiling inside Fongshan West station. A sensor to detect the passengers' movement is also installed under the ceiling about a half metre away from the installation. The rotation of the maracas creates a sound, triggered when the passengers pass underneath the art installation.

2) ***The Dance of Lighting the Universe***, (see Appendix i, Figure 20) by Wen-Yung Huang, is composed of five aboriginal totem art installations made of copper covers with hundreds of multiple coloured bulbs fitted behind them. The colourful lights shine through holes in the totem design creating a magnificent visual impact.

Figure 3-6: Touring map of computer controlled and electronic based artworks in Kaohsiung MRT

Currently (July 2010), there are thirteen computer and electronic based art installations out of a total of seventy-nine art pieces exhibited in both MRT networks. This is approximately one out of six pieces. Although computer and electronic based art installations require more frequent maintenance compared with conventional public artworks such as sculptures and mosaics, the number of interactive works is still on the increase (see the table above, Figure 3-4). The latest electronic based artwork *Listening*[7] at Huilong MRT station was nearly completed at time of writing. This suggests that the number of electronic and computer based artworks will keep rising (newly revealed interactive installations: *Fast or Slow* and Our *Personal Public Art* have been discussed in Chapter 2 pp.45-47). This indicates that techniques for the maintenance of artworks and selection mechanism have matured as the relevant authorities are showing greater confidence in increasing the number of such artworks on display. This research offers crucial reference material for the future development of this type of artwork in these public contexts.

[7] '*Listening*' by Huang Hsin-Chien, is "a mixed media installation that combines life-size sculptures with on-line video art. It invites the passerby to slow their pace and recall the history of this area; encouraging the observer to listen with their heart to this particular moment for now and the future yet to come" (Huang 2010).

3.5 Criteria for Selecting the Case Studies

The initial artworks selected for further case studies broadly encompass both interactive and electronic art installations presented in the MRT space. To focus the selection, three criteria for artwork selection for the case studies were drafted to ascertain behavioral patterns associated with specific types of artwork. The artworks had to incorporate:

1) Computer-operated interactive art installations.

2) Real time multimedia effects in response to inputs from the participants.

3) Output effects from the artworks perceivable on site.

In light of these criteria, three computer-controlled interactive artworks: *Peep* (see Figures 2-13 and Appendix i, Figure 3), *Around* (see Appendix i, Figure 4) and *Poetry on the Move* (see Figures 6-7-6-10 and Appendix i, Figures 8-9) were initially prioritised for study due to my personal familiarity with the spaces and awareness of the art installations. However, through informal field studies in Gongguan MRT station, I found the installation *Peep* was only turned on for four hours a day, from 9am to 11am and from 2pm to 4pm due to technical considerations. As the installation remains inactive on most occasions there was confusion among passengers. Some thought the installation was out of order and some said that they have never seen it working. In addition, many passengers indicated that they did not know there were screens installed on the ceiling as they never looked up.

Around in Kunyang station only had a few functioning carrousel horses, some of which did not even operate properly. The horses swung very slowly and the music was turned down to a barely audible level. The music had been turned down in response to complaints by local resident just weeks after installation of the artwork. These cases exemplify the problems that can arise from a lack of communication with the residents during the implementation of a project, as illustrated in the discussion of *The Awakening* and *Tilted Arc* in the previous chapter

(pp.37-38). These two early selections were removed from the study list as they were not functioning properly and they did not fulfill the criteria for this research, as effects were frequently not perceivable on site. Thus, *We are One Family* (see Figures 8-1-8-6 and Appendix i, Figures 5-6) and *The Legend of the Phoenix* (see Figures 6-1-6-3 and Appendix i, Figures 18-19) were chosen instead. They were a better match with the research criteria and they had more robust and reliable functionality, even though they had been installed at their sites for five and two years respectively at the time of research (2009). The three selected case studies have different interactive mechanisms resulting in different forms of interaction. The details of these three art installations will be further illustrated in Chapters 6 and 8.

3.6 Summary

The information highlighted in the first section was primarily obtained from the three sources including：

1) Observations of general activity in the stations, the passengers' responses and reactions to the artworks and occasionally through discussing passengers' opinions on the art presentations in the space.
2) The interview with Yin, the engineer from DORTS. The dialogue with Yin elicited fruitful findings in particular on the chronology of artwork introduction into the MRT stations. In addition, Yin is the key correspondent often involved in the MRT artwork selection, planning and installation processes, her perspective therefore provides first-hand information on presentation of artworks in the space.
3) Taipei and Kaohsiung MRT Companies official websites, all statistical information was obtained through these two websites.

Following an overview of the space, the second section focused on discussion of computer and electronic based artworks in the space. By examining the thirteen art installations, this section identifies appropriate artworks for the onward case studies. Some artworks originally intended to have been studied were removed from the study list after inspection. Some potentially negative factors that may have affected perceptions of the installations and artworks in the space have also been discussed. Certain recurrent issues led to the removal of artworks, for instance a lack of functionality or inadequate space for display. This initial survey of artworks played a significant role in identifying the criteria for defining the research art form and the subsequent task of selecting the suitable interactive artworks for this research.

Chapter Four — Debates and Consensus over Interactivity, Play and Meaningfulness

4.1 Introduction

This chapter presents literature reviews focusing on three fundamental research areas of: 'interactive art', 'meaningful experience' and 'play in interactive arts'. It will first present the challenges in defining the term 'interactive' through a critical comparison and analysis of the views and taxonomies of interactivity that have been proposed by prominent art researchers, practitioners, and critics in the field (Ascott 2001, Candy and Edmonds 2002, Graham 2010, Manovich 2001, Penny 1995, Rokeby 1995 et al). This study found there to be a degree of mutual contradiction in these attempts to establish a firm definition for the term, suggesting these difficulties are not simply a result of the relative youth of this growing art genre closely linked with the development of technology. They also arise because it is a 'hybrid art form' (see Glossary, p.xii), that draws on the composition of conventional media. Thus, instead of investigating an infinite loop of definitions, it proved more fruitful for this study to examine the features and elements that constitute interactive art, for instance 'active participation', 'control', and 'real-time response'. This approach has helped to clarify the nature of the research art form, allowing this research to offer more specific and substantial contributions to the field.

The following section discusses 'physical involvement' and focuses on play emerging from the interactivity. Responding to a repeatedly asked question: *What is the difference between the play in computer-based interactive art and commonly associated play with video games?* the study explores the discrepancies between the play and in these two media. This exploration commences with a general discussion of play and game illustrated by assigning them personalities and traits. The analysis is based on literature reviews on play and game (Gadamer 2004, Huhtamo 1995, Huizinga 1955, Kaprow 1993, Winnicott 1971 et al). This study

concludes that play in interactive art and video games is differentiated based on the different personalities and traits, together with the four themes, Open-Goal, Ambiguity, Effortless, and Enjoyment , which were proposed in one of my previous publications.

The final section in this chapter addresses one of the fundamental questions in this research: *What is a meaningful experience?* This question was dissected into three parts to examine the constituent factors that make up meaningful experience. The examination started by exploring what is meant by experience and how it is formed, and then developing an understanding of meaningfulness. Three conditions that generate experience have been highlighted, facilitating the identification of potential elements capable of evoking meaningful experiences. A number of established theories regarding experience of artistic interactions (Ascott 2000, Csikszentmihalyi and Robinson 1990, Dewey 2005, Eisenberg 2007, Murray 1997 et al) have helped provided the basis for this discussion. The latter part of this chapter analyses the generation of meaningful experience within the context of interactive art, presented, in particular, within non-art public spaces. This is based on an understanding that meaningfulness only exists in specific contexts and for individual interacting with elements of those contexts.

4.2 Interactivity amid the Interactive Arts

“You have to base your definition of interactivity on what’s out there” (Downes and McMillan 2000).

‘Interactive’ has become a buzz-word seen to possesses a magical power to raise the value of an object, from TVs and mobile phones to television dramas. Nearly anything involving technology or with a certain level of data or information exchange between people in any form can be claimed to be interactive. As a result, the word ‘interactive’ has become problematic as an ambitious catchall cliché, becoming an almost meaningless term applied to an excessive range of material and immaterial events and activities. Consequently, the overused term ‘interactive’ often incurs disagreement in professional circles and even more so in academic discourse. It is evident that using this term without defining it in a specific context leads one into a quagmire of debate. “Nevertheless, attempts to settle upon a single definition are pragmatic because these concepts are multi-faceted and because multiple definitions apply concurrently. Like information, interactivity is not a monolithic concept, but because it is an emerging field, examination of interactivity must be narrowed” (ibid).

One rudimentary definition describes the basic mechanical mechanism and functionality of the majority of interactive systems.

> (Of a computer or other electronic device) allowing a two-way flow of information between it and a user; responding to the user's input: interactive video.
>
> (Oxford Dictionaries 2010)

This essential feature of interactivity is often seen in interactive artworks that respond to the participants’ gestures, movements or presence and stimulate the participant to contribute some form of input. The participant’s input then evokes various interactivities and multimedia

presentations. This is exemplified by works such as: *Flow5.0*, by Daan Roosegade (2007), *Audience*, by Chris O'Shea (2008-09), and *Body Paint*, by Mehmet Akten (2009). I personally experienced these artworks in Decode[1], an exhibition held in the V&A museum, London, April, 2010. The above definition is unproblematic for these artworks mechanisms of interactivity as it accurately describes the basic process of a computer's interactive function. Although the definition only depicts operational mechanisms based on the essence of the medium, it does, to some extent, distinguish the nature of interplay in interactive art and conventionally static art forms.

However, Manovich (2001 p.55) deemed the definition a tautology in describing HCI (Human Computer Interface); as computer-based media are, by definition, interactive. Thus, the definition from the Oxford English Dictionary Online is insufficient to mitigate this debate, as the definition is argued to be superficial as it barely emphasises the functionality of the medium. Moreover it is too broad to be useful to this field as it defines any activity on a computer as interactive, for example, using a computer's calculator, chatting via instant messenger or corresponding via email.

Manovich (ibid p.57) highlights that "there is the danger that we will interpret 'interaction' literally, equating it with physical interaction between a user and a media object (pressing a button, choosing a link, moving the body), at the expense of psychological interaction". This concern is especially pertinent to discussion of the use of the term in artistic interaction. Dewey (2005 p.56) argues that "for lack of continuous interaction between the total organism and the objects, they are not perceived, certainly not aesthetically," and he goes on to say that "to perceive, a beholder must create his own experience."

[1] (Decode: Digital Design Sensation 2010)

According to these arguments, the Oxford Online Dictionary definition has omitted the psychological aspects of interaction from its definition. On the other hand, such discourse may simply reveal the challenging nature of defining the term 'interactive' through universal uses.

The OED definition may not be convincing to art researchers, critics and artists themselves as they may contend that the interfaces of multimedia presentation and medium interaction are just bait to lure viewers in to participate in interactive systems. In artistic practise, mental and emotional interaction concerned with fulfilling, meaningful experience are equally important as physical interaction, which may be used to elicit artistic intent. Morse indicates (Malloy 2003 p.18) that "interactivity is not just an instrument or perhaps irritating interval between clicking and getting somewhere else, but an event that brings corporeal and cognitive awareness to this increasingly ubiquitous feature of the contemporary world". Based on Morse's argument, interactive art is by neither a solely physical participation nor an exclusively psychological engagement but a combination of both.

Graham amended the definition of interactive as stated in the Oxford English dictionary to the following:

> "Interactive…reciprocally active; acting upon or influencing each other" (cite in Graham 1997 p.31)

She adapted the term to '*act upon each other*' (Graham 2010 p.112) and to form the basis of her research.

In her book '*Rethinking Curating'* (ibid), she proposed a 'Participative System' as a conceptual tool to explain different presentations of computer-based artworks and categorises them into 'Interactive', 'Participative' and 'Collaborative'. Graham believes that artificial intelligence has

yet to achieve real interactivity in art interaction between humans and computer-based artwork. Thus, true interaction between humans and technology rarely happens and may only exist between multiple participants in an interactive artwork. Her views is that interactive art merely acts as a 'Host' to encourage interactivity between participants, rather than an individual participating in interaction with the work itself (Graham 1997-2010). However, this argument does not focus on the distinction between works that incorporate computer mechanisms and static artworks, some of which are also capable of being a 'Host'. This can be seen in *Cloud Gate*[2], by Anish Kapoor (2005), a gigantic mirror-like public artwork exhibited in Millennium Park in Chicago. In *Cloud Gate* people use their distorted images to play not only with acquaintances, but also with strangers.

Rokeby (Penny 1995 p.137) foresaw more than a decade ago that one would be taking an 'extreme position' in defining this art form and asserted that debate would become increasingly common. Kravagna (Dezeuze 2010 p.241) also discusses the three terms: 'Interactivity', 'Participatory' and 'Collaboration' in a non-computer based context of 'participatory art', in which she asserts "Interactivity goes beyond a purely perceptual proposition in that it allows for one or more reactions to affect the work – usually in a momentary, reversible and repeatable manner – in its appearance, but without fundamentally changing or co-determining its structure". There is an important distinction between Graham's interpretation and Kravagna's definition. The former claims that real interactivity can only be achieved between people, while the interaction among the participants is often out of control. The latter crosses the physical boundary and admits the existence of interaction between individuals and an anticipatable manifestation of the artwork.

[2] An outdoor 12-foot-high cloud shaped stainless steel sculpture is exhibited in Millennium Park, Chicago (Millennium Park Chicago 2010)

An early identification of different levels of interactive systems, ‘Dynamic System’ proposed by Cornock and Edmonds (1973), categorised the interaction between artists, participants and art environment into three levels: 1) ‘The static system’ functioning purely on the psychological interaction between conventional static art forms. 2) ‘The dynamic passive system’, a pre-defined system created by artists which acts automatically and does not take external inputs, for instance from audiences. 3) ‘The dynamic-interactive system’, a presentation of the work which can be influenced by audiences’ physical inputs. This final level maybe the most common feature experienced in the majority of interactive artworks, such as the three pieces from the Decode exhibition (see p.74) mentioned above. The ‘Dynamic Interactive System’ was updated by Candy and Edmonds (2002), in which they presented the definition for the previous undefined system of 4) ‘dynamic–interactive (varying)’, this system was derived from the third system with the addition of unpredictable variation. With this system, the presentation of artwork is affected by and differs between participants. *Weave Mirror* (see Figure 4-1) also exhibited in ‘Decode’ fits this category as the presentation of the artwork is never the same and varies from person to person, affected by how they interact with it. Certainly, these systems cannot be said to be fully self-contained when strictly compared with Graham’s ‘Participative Systems’. The contrast again highlights the level of difficulty in defining or using the term ‘interactive’ without providing sensible examples in specific contexts. Any inflexible definition may confine practicality and limit usefulness of the term. Discussing the definition of ‘interactivity’, Kravagna (Dezeuze 2010 p.241) remarks “the boundaries are permeable, and that rigid categorisations are not useful.” Downes and McMillan (2000) also note that definitions about interactivity are often contradictory.

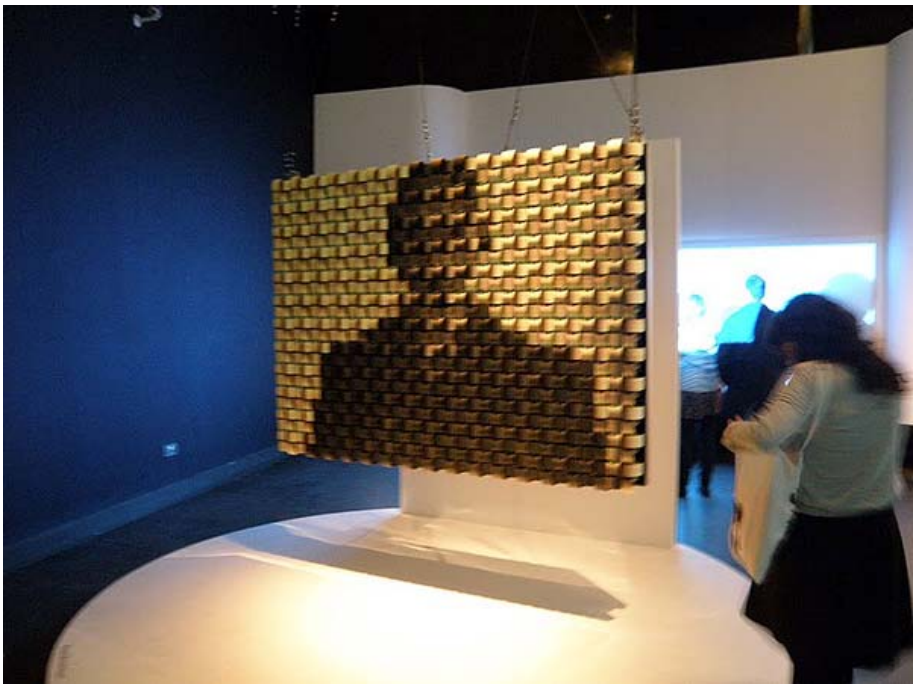


Figure 4-1: *Weave Mirror* in Decode: Digital Design Sensation 2010

In addition to the discussions the definition of ‘interactivity’, the following questions are commonly asked about physical involvement within the context of artistic interaction:

1) By allowing the participant to have a greater capacity for manipulation, they are thus given more control over the course of interaction. Why is control deemed a crucial element in defining this art form and what are the means of control employed within the context?

2) Are real-time active inputs from participants and outputs generated from artworks the key determinants in defining this art form?

3) What does ‘play’ yield from this participative or responsive art form and how does it differ from general play activities in video games?

Control as Capacity for Realising the Art

Active physical involvement within the process of art interaction is a crucial element in embodying an artwork (Rokeby 1995, Rogala 2005, Ascott 2001, Morse (Malloy 2003), Dezeuze 2010 et al). Physical involvement, allowing the participants to control the interactive flow and environment is deemed one of the essential components of this art form. Nevertheless, people may argue that physical input does not guarantee that participants will obtain a reasonable interactive experience, for instance by clicking on a button, scrolling down a web page, and triggering a sensor. Csikszentmihalyi and Robinson (1990 p.87) argue that "the ability to generate feedback is a relatively important, but apparently unnecessary element of the aesthetic experience". However, without this 'ability' the participants may not be able to enter the 'wonderland' (Julian and Carole 2004 pp. x-xii) to appreciate the artwork.

In the discussion of interactive art in this research control denotes the inception of interactivity. Rafael Lozano- Hemmer (2005) mentioned in an interview with Barrios that "in linguistic theory Saussure would say that it is impossible to have dialogue without being aware of your interlocutor". Control (even if unintentionally) triggers an awareness of existent entities, functioning as a connector to link audiences and artworks, and may further turn involuntary viewers into active participants. Active participation is a way of retaining the manipulative capacity of the audience. Through control of interactivity the participants play an important role through their power to embody the artwork. Additionally, through the process of control, the participants share a sense of creativity with artists, and very often with other participants. Although, 'control' functions as the basis of initiating interaction in a mechanical sense, under the themes of this discussion, it is not simply the attainment of responsive reactions or didactic information by clicking the button on your mouse or triggering a sensor when passing in front of an artwork. It serves a more advanced and dynamic purpose, in which the capability for control yields the possibility for development of meaningful experience through interaction

between artworks. Murray (1997 p.170) asserts that “digital narratives add another powerful element to this potential by offering us the opportunity to enact stories rather than to merely witness them”.

Within the research context ‘control’ could be compared to driving a car to explore an already made dynamic fantasy territory. Though the participant does not create the car (interface) or the routes (content), they have to decide which routes to take. Through the explorative journey they discover ‘wonderlands’, and in order to see more of the scenery, the participant has to react. Diverse experiences may be generated through this physical involvement and interaction; “you’re not contributing them all yourself, they’re really there, it’s discovering them, that’s what makes it fascinating” (Csikszentmihalyi and Robinson 1990 p.128). Control, is one of the key elements in engendering more subsequent fulfilling experiences. Indeed it plays an essential role in interactive art interaction. Control is key not in activating a simple reaction, which is by no means the ultimate goal of most interactive artworks, but in serving a higher intention by allowing emancipation of meaningful experience. Gadamer (2004 p.122) notes that “obviously there is an essential difference between a spectator who gives himself entirely to the play of art and someone who merely gapes at something out of curiosity.”

Real-Time Response

Penny (1996) noted that “interactivity implies real time, now.” He was aware that the conditions would change and that the definition could only be set, based on the current climate and environment at the time of writing. A decade on, this immediacy has become an uncertain condition. More diverse forms of the interactive artworks have appeared. Though the majority of interactive art installations respond to actions and generate outcomes in real-time, time-delay based interactive installations have emerged, for example, *Venetian Mirror* by Fabrica (2009), one of the interactive installations exhibited in Decode[1]. This artwork does not instantly respond to movements, it works only if the participants remain still in front of the installation for a

moment. This allows the art installation to take multiple intermittent images of the participants and after a short period of time their multi-layer after-images gradually appear on the mirror.

Figure 4-2: *Venetian Mirror* in Decode: Digital Design Sensation 2010

Another issue concerning inputs and outputs of an interactive mechanism may be the distinction between two different types of art interaction: one based in real-time response and the other in self generated response. Real-time response interaction normally requires onsite inputs from participants and the outputs produced by the artworks are usually perceivable. Self generated interaction is slightly controversial as it operates autonomously when interacting with various external resources, for instance, randomly capturing specific data on the internet and converting that data into input for interactive presentations. The following artworks illustrate self generated interaction: *Metroscopes*, by Gillman (Clive Gillman 2003), *Listening Post*, by Hansen and Rubin (The Science Museum 2004) and *Cybraphon*, by Campbell, Kirby and Perman (Cybraphon 2009). The participant in real-time response interaction are usually aware of a reactivity being generated by the artwork that is sufficient to prompt spontaneous input from the participant and often leads to successive interactive loops. By contrast, the participant in self

generated interaction generally acts as an unconscious source contributor; they indirectly interact with the artwork, while being unaware that they are the participant of an interactive system. Self generated interaction has drawn debate over its categorisation as interactive art. For example in his article; '*Trouble at the Interface*' Huhtamo (2004) argues that *Listening Post* should not have received the Golden Nica[3] award for interactive art. He objects to the award because the art installation operates as a self-generated interactive system, the capture of the interaction (specific wordings) from online chat rooms and the display of the outcome are implemented solely by the system itself. The person using the chat room does not directly interact with the artwork and may not even know their online chat is being used as the source of this interactivity.

Downes and McMillan (2000), in their article about computer-mediated communication, deftly note that "two key components of interactivity are the messages themselves and the people who participate in interactive communication". However, perhaps they did not expect that after a few years some interactivity would be generated by the artwork itself by capturing online resources. Despite Huhtamo's objections to awarding the Golden Nica to *Listening Post*, he does not take a firm stance on whether or not the artwork is truly interactive. Apparently, the previous concern over delay and immediacy has been erased by later presentations of the art installations. Nevertheless, it remains uncertain whether direct participation is a determinant in defining this art genre. Morse asserts (Malloy 2003 p.22) that "the result of an interaction is a change of state or condition —in this case, that of connecting, but connecting to what and to what end? The answer is not yet entirely in sight, since interactivity is a feature of a great societal and cultural transformation in progress".

[3] "Golden Nica is one of the most prominent prizes in the field of interactive, electronic, hybrid art, computer animation, digital music and communities. It has been awarded since 1987 by Ars Electronica in Linz, Austria" (Ars Electronica 2010).

4.3 Play amid the Interactive Art and Video Games

The key question for this research raised in the previous section is: *Whether having a capability of control and instantaneous responses are instrumental features of the genre of interactive art?* This section explores a derivative question: *What distinguishes play in computer-based interactive art from the play commonly associated with video games?* This question has often been raised when presenting this research in art and technology related conferences. Instead of directly plunging into the main topic, the discussion starts with by identifying the discrepancies between play and games by assigning traits and personalities to them. The findings of this section offer some productive references to assist in the differentiation of play in interactive art from play in video games.

Personification of Play and Game

Play and Game are restless identical twins sharing the same 'active gene'. While these twins are of course in many ways identical, there are dissimilarities between them. The older brother (Play) is relatively easygoing, gentle and independent, while the younger one (Game) behaves more scrupulously, and is more organised but always needs companionship and is sometimes quite belligerent. These distinct temperaments are not quite sufficient to form a self-evident demarcation between play and game. Huizinga (1955 p.6) reminds us that "the more we try to mark off the form we call 'play' from other forms apparently related to it, the more absolute independence of the play-concept stands out". Thus instead of shaping distinction between them I started with an attempt to identify their different 'personalities'. This approach was initially drawn from Huizinga's play characteristics that incorporate the polarity of play (ibid pp.8-9). Three main characteristics of play are:

1) Play is free, it is, in fact, freedom
2) Play is not 'ordinary' or 'real life'
3) Play is secludedness and limitedness

Huizinga (ibid p.1) notes that an ‘active principle’ may be considered to be the ‘essence of play’. Similarly, the nature of game is based on this principle. Winnicott (1971 p.52) highlights two key qualities of play which reflect the idea of active physical involvement, 1) “the manipulation of objects”, and 2) “certain types of intense interest that are associated with certain aspects of bodily excitement”. Gadamer (2004 p.104) also indicates that “the movement backward and forward is obviously so central to the definition of play” and he goes on to say that the game itself is to be played. Apparently, physical involvement is their first mutual trait. Kaprow (1993 p. xxii) also indicates that “play at its most conscious level is a form of participation.”

Rules are a common feature that define space, time and form in both types of activity, allowing for game and perhaps also play to be established. However, rules have different functions in game and play. (ibid p.122) notes “in play, one is carefree; in a game, one is anxious about winning.” On most occasions the rules of play are relatively tolerant as it is not necessary to stick to the rules scrupulously in order to allow play to be carried out, for instance one can play football anytime in their own back garden; the only thing the players need to do is to kick the ball and maybe try not to disturb the neighbours. However, if it is a football tournament, a proper space, a certain number of players and rules will be imposed more rigorously. In other words, rules are an indispensable element for games to take place. While rules in play are usually flexible they are normally strictly implemented in games. According to Gadamer (2004) the game will fall apart if one suddenly disobeys the rules. Although Huizinga does not make a direct distinction between play and game, he deems rules to be in their essence ‘holding games’, as he points out “all play has its rules. They determine what ‘holds’ in the temporary world are circumscribed by play. The rules of a game are absolutely binding and allow no doubt” (Huizinga 1955 p.11).

Despite the fact that both play and game require a certain period of time and space to be carried out, Kaprow (1993 p.122) remarks that play "offers satisfaction, not in some stated practical outcome, some immediate accomplishment, but rather in continuous participation as its own end". The time in play can be very relaxed and flexible and the play could be initiated or terminated at any moment depending on the players without dramatically influencing the quality of the play. Huizinga (1955 p.7), states that "all play is a voluntary activity. Play to order is no longer play". However, time in the game is usually rigid. None of the players are allowed to arbitrarily demand a suspension of the game as it may result in abstention of individual players or it could further lead to the collapse of the game. Gadamer (2004 p.105) remarks "someone who doesn't take the game seriously is a spoilsport".

Response is also one of the distinctive traits of both play and game. Nevertheless, in comparison with games, a mutual dynamic and spontaneous response is not a definitive condition in play, as it could be carried out step by step. Multiple players may be involved in play as often as in a game. Nonetheless play can still be achieved by a single player, whereas game often requires a group of players as a reciprocal response is a crucial element in the constitution of the game. (ibid p.106) asserts "the movement to-and-forth obviously belongs so essentially to the game that there is an ultimate sense in which you cannot have a game yourself".

Competition is the fundamental feature of games, for instance the final objective in a formal football match is to win the trophy and there is no doubt that the players are very serious about the game. Even in video war games, people consider themselves to be warriors and experience adrenalin rushes while fighting merciless enemies. (ibid pp.105-6) asserts that "it is true that the contestant does not consider himself to be playing". Whereas in play, the players often play as other characters and a sense of rivalry and tension is rare. Huizinga (1955) considers game as a play-world. Play acts as the key component of game and together they form an integral entity.

Gadamer considers game to be a saturated form of play; it is realised by play. In contrast to the previous two statements, Kaprow's delineation between play and game, quoted below, is relatively clear. However Kaprow's distinctions are linked to both Huzinga and Gadamer's theories.

> This critical difference between gaming and playing cannot be ignored. Both involve free fantasy and apparent spontaneity, both may have clear structures, both may (but needn't) require special skills that enhance the playing. Play, however, offers satisfaction, not in some stated practical outcome or some immediate accomplishment, but rather in continuous participation as its own end. Taking sides, victory, and defeat, all irrelevant in play, is the chief requisites of game. In play one is carefree; in a game one is anxious about winning (Kaprow 1993 p.122).

As there are several crucial elements residing in various types of play, for instance, profit, uncertainty, representation and skills, as such, the discussions above are insufficient to form universal definitions to cover all features of play and game. However, as these elements of play are not the key focus of this study of interactivity, there is not the scope here to explore them in their entirety. Huizinga (1955 p.28) reminds us that "when speaking of play as something known to all, and when trying to analyse or define the idea expressed in that word, we must always bear in mind that the idea as we know it is defined and perhaps limited by the word we use for it". However a discussion of their traits and features illustrates the fundamental distinctions between play and game. This lays the foundations for further identification of possible discrepancies between play computer-based interactive art and play in conventional video games.

The Interactive Arts and Video Games

"Video games may be remarkably complex in their architecture, but they are a form of goal-oriented activity, whereas art is multi-layered and open-ended. There is no final 'solution' to an interactive artwork, no way to exhaust its meanings" (Huhtamo 2009).

Perhaps, the 'active principle' is the factor that raises the question: *What is the difference between play in computer-based interactive art and the play commonly associated with video games?* In comparison with identical twins: 'play' and 'game', interactive art and video games could be likened to a fraternal twin as both require a degree of physical involvement combined with an embedded notion of play. However, the resemblance between interactive art and video games is not as profound as the identical twins; play and game. In fact the play within interactive art is not a desire for competition; while competition is the core of the play in video games. Indeed, winning is often the final objective of game players. Though the play in these fraternal twins shares similar features, it has a distinct function in each. The function of play in interactive art is usually to lead to an exploration of the work with fewer and loser rules imposed. Conversely the play in video games is primarily intended to achieve victory and the rules are relatively precise. Kaprow (1993 p.106) argues that in experiencing art "playfulness and the playful use of technology suggests a positive interest in acts of continuous discovery". While Gadamer (2004) describes this as the exploration and mediation of play being transformed into art.

Through conducting an extended literature review on the phenomena of play and game, this study has drawn extensive comparisons of play in interactive art and in conventional video games. This led to the establishment of the four qualities of play (Open-Goals, Ambiguity, Effortlessness, and Enjoyment) proposed in one of my earlier publications '*Playing Interactivity in Public Space*' (see Appendix vi, p.138). The four qualities of play emerged primarily from

this study's field observations, which highlight that play interactivity occurred between the passengers and the interactive artworks in the MRT stations. The findings have reciprocally informed the discussion of divergence between play and game.

Open-Goals: Sims (1997) remarks that "the definition of an activity as a game is in the mind of the player". The audience in this research context do not usually consider themselves to be players. They normally do not expect to encounter unpredictable joyful activities in such public settings, but nevertheless, often inadvertently step into the 'Magic Circle'[4], where the play activity evolves. The participants play with curious, explorative, and joyful sensations without a preoccupied awareness about what may come of it. In my field studies they waved their hands, shook their feet, moved to-and-fro and danced in front of the art installations. These responses were obviously characteristics of play. Nonetheless those movements entailed no specific goals.

Ambiguity: The players are aware that they can only proceed with the game if they comply with the rules. Conversely, the rules in play within interactive art are relatively tolerant. Play amid ambiguity is common within the interactive arts. "The purpose may be merely to make the system seem mysterious and thus attractive, but more importantly it can also compel people to join in the work of making sense of a system and its context" (Gaver 2003). During the field observations, the observers seemed not to know when or how the play began (how and why the multimedia effects were triggered). As soon as they started to suspect they might be the instigator of the effects, they attempted to figure out the source of the effects and the trigger for them.

[4] 'The magic circle' is a term borrowed from Huizinga's 'Homo Ludens' (1955 p.10). "All play moves and has its being within a play-ground marked off beforehand either materially or ideally, deliberately or as a matter of course."

Effortlessness: On most occasions, a certain level of prior knowledge or skill is required to allow play to be initiated. Moreover, players are normally consciously of the play, aware the moment before it begins. However, in the play activity in this research, that prior knowledge, skill, and prior-awareness did not usually exist. This is a crucial element to the play discussed here as it did not require an active input from the participants to set off an initial interaction. On most occasions the play began with a sense of curiosity, as an active initial trigger to change the effects was not often demanded from the participant. The participant's contribution was encouraged without requiring specific skills or prior-knowledge. "It is part of play that the movement is not only without goal or purpose but also without effort" (Gadamer 2004 p.105). This acted as an ice breaker allowing 'Tentative Play' (Her 2010) to take place autonomously. According to Huizinga (1955) play "is never a task. It is done at leisure, during 'free time'".

Enjoyment: Enjoyment is an integral form of play in the context of this research and it often involved elements of spontaneity, fun, curiosity, exploration and learning: "play is essentially satisfying" (Winnicott 1982 p.61). In public spaces (transport hubs) people often play with the interactive artworks because they find the magic-like multimedia effects interesting and become curious as these unexpected effects respond to their movement in real time. The combination of spontaneity, enjoyment and curiosity often leads to exploration and furthers the derivation of fulfilling experience. "Once played, it endures as a newfound creation of the mind, a treasure to be retained by the memory" (Huzinga 1988).

Although frequently identified from the interactivity generated between the participants and interactive artworks in the transient space of the MRT, these four qualities of play may not always be fully manifest in artworks exhibited in similar public contexts. For instance, in the *Piano Stairs*[5] by the Fun Theory.com presented at the Odenplan metro station, Stockholm the passengers were initially intending to take the escalator next to the stairway, however when they

noticed the staircase could be played as a piano, they were tempted to play it. As the passengers generally possessed a common knowledge of how a piano functions (regardless of whether they were professional pianists or just playing for fun), Open-Goals, Effortlessness, and Enjoyment were all displayed, though Ambiguity was not. While, the four qualities of play do not necessarily illustrate all the features of play interactivity that come about within the research context, they assist in distinguishing play in interactive art and play in video games. This distinction could inform and assist the creative processes for future interactive artworks by offering guidance in the generation of appropriate 'play'.

[5] The Fun theory.com Piano Staircase (Volkswagen 2009)

4.4 Meaningfulness amid Interactivity

"There are other meanings that present themselves directly as possessions of objects which are experienced" (Dewey 2005 p.87).

The aim of this research is to help future artworks to elicit meaningful experiences from audience while they interact with the interactive artworks and to bridge their experience with artistic intent or artist's preconceptions. This raises another frequently asked question: *What is a 'meaningful experience'?* Indeed, as with the term 'interactive', meaningfulness escapes easy definition, if one uses it without providing adequate references to a specific context. Dewey (1997 p.25) suggests that "to know the meaning of empiricism we need to understand what experience is". Hence, prior to commencing the examination of potential factors in how meaningful experience is constituted, this study will first examine what experience is and how experience is aroused.

Merleau-Ponty (1945 pp.15-29) demarcated 'perception' (present), 'memory' (past) and 'experience' and explained their interrelationship. For him to perceive is neither to remember nor to experience, though there is a symbiotic relationship between them. Perception is pure sensory encounters with the world outside the self, but also an indispensable source of memories. By recalling and restructuring memories, experience is formed based on several collective epitomes. In light of this notion, with a somewhat private essence to both memory and perception, this study postulates that 'experience' is a combinational entity that possesses a certain degree of meaning and thus is individual. Dewey (1997) also believes experience resides in individual persons, constantly nourished from external influences. In addition, Dewey (ibid) indicates that experience consists of various immaterial entities that cover "the formation of attitudes, attitudes that are emotional and intellectual; it covers our basic sensitivities and ways of meeting and responding to all conditions which we meet in living" (ibid p.35). This

standpoint implies that experience is not a solid invariable being, but a hybrid and dynamic product yielded from on-going interactions between different people and between a person and their environment. Similarly, Gadamer (2004) considers every experience to be a fragment in a continuous life, in which fragments relate to each other and make up one's whole life.

Although experience is a cumulative immaterial product, it possesses no intrinsically positive or negative qualities. Any positive or negative aspects are determined by various external influences. Since experience has variable and dynamic qualities it cannot be taught as a finished product but can be attained by individuals from their participation in activities or events. Thus, Dewey (1997) distinguishes experience from meaning or knowledge, which can be taught. People know the Giza Pyramids from various sources; they do not go to Egypt to acquire knowledge of the pyramids, but instead they go to experience them. Experience derives from resonances between a person's prior-knowledge of objects or events and their physical sensory participation (perception). Each experience is unique though with similarities; Gadamer deems this 'self-knowledge'. The above discussion highlights three significant factors in the nature of experience:

1) Experience is the accumulative form of individual beliefs
2) Despite small similarities experience varies from person to person
3) A certain level of physical participation is often crucial in obtaining experience

It is not the intention of this study to establish an abstract philosophical theory to interpret the nature of experience. Nonetheless, the three factors above help facilitate the illustration of a basic form of experience and how experience is generated. This is crucial in deepening understanding of the relationship between experience and meaning. Moreover, these factors permit the construction of a basic idea of how meaningful experiences may be elicited through interaction with interactive art installations.

Meaningfulness

Based on Dewey's theory of art, experience, and nature, Alexander (1987 p.138) argues "Meaningful response to an object in a situation which involves reintegration of 'disturbed coordination' in which both intelligence and emotion are interrelated and fulfilled."

Whether things can be perceived as meaningful is to some extent dependant on whether audiences are able to apprehend, interrelate or interpret the language that is presented to them. Nevertheless, the question of what constitutes meaningful experience is still ambiguous. The definitions from the Oxford English Dictionary online can be used to initiate the discussion.

> Meaningful: having meaning: *meaningful elements in a language, words likely to be meaningful to pupils*
>
> - serious, important, or worthwhile: *the new structure would bring meaningful savings*
> - communicating something that is not directly expressed: *meaningful glances and repressed passion*
> - Logic having a recognisable function in a logical language or other sign system
>
> (Oxford Dictionaries 2010)

The definition of meaningful in the Oxford English Dictionary online draws upon various aspects of human experience. In this research I am focusing on meaningful response to objects, particularly concerning responses from interaction with interactive art installations. The word meaningful seems to imply an intrinsic quality, however the elements in meaningfulness do not evolve baselessly. They are embedded and evolve within individuals' previous experience, knowledge and memories. A sensation of meaningfulness is often evoked or co-constructed when one discovers new entities or, when one's internal state corresponds to both external objects and conditions.

Repperell (Ascott 2000 p.144) figuratively delineates the concept of consciousness developed in specific conditions through the process of boiling water. He infers that in order to boil water one has to have a vessel, water, fire and then combine those elements together in the right way and boil the water for a specific period of time. The implication is that consciousness develops through a basic formula which can be applied to evoke meaningful experience, as such experience emerges when those elements and conditions are matched.

The elements in this research context function as a reminder or instigator to trigger suitable internal states allowing for the development of associations between these states and external conditions. This reminder element can be encapsulated by what Winnicott (1971) refers to as ‘transitional objects’. He coined this term and explained it through an analogy of a teddy bear, which gives a child comfort by re-experiencing a physical engagement that they may associate with their mother. At the same time, the teddy bear allows the child to develop and experience the role of taking care of something that is small and which can be embraced. Winnicott deems the whole process as a ‘transitional’ experience whereby memories and sensation are provoked and projected on replacement objects.

Unlike meanings in words or sings, the concept of meaningfulness discussed here is not didactic or rigid. Instead it allows itself to be disclosed and freely interpreted while often triggering sentiments in individuals. Alexander (1987 p.250) remarks that “the arts are connected because they share a common concern for rendering experience meaningful in a concrete way”. In other words, meaningful experiences emerge when audiences are able to communicate facts that the art possesses and presents to them. Gadamer (2004 p.484) notes “when we understand a text, what is meaningful in it captivates us just as the beautiful captivates us.”

Latent Meanings in Perceivable Interactivity

"Art as an enactment of mind implies an intimate level of human interaction within the system, which constitutes the work of art, an art without audience in its inactive mode" (Ascott 2001 p.70).

Meaning and meaningfulness can dwell in artworks, however they cannot be released or activated until participants interact with the artwork. Likewise participants will not be able to access the true intention of the artwork or an appropriate appreciative experience without their active involvement or contribution. As with the metaphor of boiling water for the development of consciousness made by Repperell (Ascott 2000) mentioned above, even though the necessary factors to produce meaning are present, a trigger from one of these factors is crucial for the generation of meaning. Within the research context, active participation is often deemed the instrumental component in embodying the works of art. Dewey (2005 p.56) considers 'interaction' an action of mutual recreation; "without an act of recreation the object is not perceived as a work of art". Thus far, the discussions have reaffirmed the significant notion that meaning does not only reside in objects or within specific contexts, but is also latent in the potential processes of interactivity. Furthermore, this latent meaningfulness generated within interactivity often carries messages. Nevertheless, these messages usually rest in a dormant state, their forms varying when realised by each individual. Eisenberg (2007 p.7) points out that "clarity (and conversely, ambiguity) is not an attribute of message; it is a rational variable, which arises through a combination of source, message, and receiver factors".

In the context of this research, meaningful experiences are manifested in diverse messages, which are often perceived as a sense of fulfilment, intellectual reward or artistic intent and so on. Indeed they can be something audiences obtain inspiration from or learn through repeated to-and-fro interaction with artworks. "As I move forward, I feel a sense of powerfulness; of

significant action, that is tied to my pleasure in the unfolding story" (Murray 1997 p.132); without meaningfulness there would be no point of genesis from which stories would unfold. Gadamer (2004) describes the process of revealing stories as unearthing hidden dimensions. The capacity to disclose narratives often results in and encourages participants by offering a clear perceivable outcome. This outcome in turn evokes subsequent actions from the participants and prompts them to contribute further inputs to reveal the stories. Csikszentmihalyi and Robinson (1990 p.123) claim that the "clear goals and clear feedback serves to prolong and often to deepen the focusing of attention of the object."

The stories are often preset by artists as the primary intention in artistic creations. Nevertheless, in comparison with conventional art forms, the stories in this research context of interactivity usually contain more than one plot and are waiting to be unfolded and reconstructed by individuals based on participants own understanding. The participants are certainly not realising a monologue directly imposed by the artists onto the artworks. A discussion with Jose Luis Barrios, Rafael Lozano-Hemmer (2005) indicated that the result of the interactivity "depends on the project and how it is received. Often the response to the work is very different from what I had imagined". The meaning of art in the research context is not didactic, instead it is latent within the interactivity. In Csikszentmihalyi's book '*The Art of Seeing*' he notes "he doesn't provide stories. He allows them [,] the viewers [,] to trust their instincts and [to] come to terms with the work" (Csikszentmihalyi and Robinson 1990 p.124).

Meaningful interactivity within this research framework is neither tied to the concept of 'acts realising a work' nor is it solely a meaning intrinsic to discernable responsive multimedia effects. The artwork's capacity to impart an understanding of its interactive mechanisms to the participant may be a crucial element in providing the clues for the audience, permitting the development of their own meaningful rewards through interaction. Without sufficient clues,

artworks may not be able to further engage with the audience, merely attracting their attention to external properties intrinsic to the work rather than generating meaningful experience through a process of interaction. “People found their experiences enhanced when they widened their focus beyond the work of art that was their primary concern” (ibid p.121).

4.5 Summary

The discussion of three fundamental research areas provided the basis for this research and facilitated progression in different phases of the research, particularly in identifying specific contexts and in the selection of appropriate artworks for the case studies. This chapter shows how previous definitions can become untenable as the field progresses with new definitions continuously being developed. Indeed, the development of technology is in a perpetual state of progression and dynamic change. This poses a tremendous challenge to establishing a firm definition for this art from.

However, the objective of this research is neither to attempt to lay a universal definition for this art genre nor to provide an exact definition of interactivity for all contexts. Instead it is about deepening understanding of interactivity in the context of this area of research, with the intention of learning how meaningful experience can be elicited. Graham (1997 p. 38) points out that “there is not one smooth scale of ‘levels of interactivity’; it may be more productive to look at ‘kinds of interactivity’”. Huhtamo (1995) also indicated that “one way of approaching this problematic area is through the analysis of interactive art”. Likewise, in discussing the concept of ‘intelligence’ with an initial attempt to form a working definition for the term, Kruger (Ascott 2000 p.155) states that “it is difficult to understand how one could proceed without reference to such a definition”. The same principle can be adopted when utilising the term ‘interactivity’ as well as ‘meaningfulness’ in this study. These concepts have provided a springboard for the development of this research.

Assigning personalities and traits to both play and game in this chapter has helped to highlight the discrepancies between general play and games. This in turn has led to further identification of possible differentiations of between play in interactive art and play in video games. The four qualities of play (Open-Goals, Ambiguity, Effortlessness, and Enjoyment) proposed in this

section are the forms of play that frequently emerged from the field observations of interactivity generated between the passengers and the interactive artworks in the MRT stations. Although they may not be generalised to all play activity that took place in the MRT spaces, the four qualities of play offer an alternative reference for the features of play outlined within interactive art in this research context.

Since this research covers interactivity between artworks, participants and technology, one additional issue raised is *how information can possibly transfer to experience?* The first step in answering this question is to identify the differences between information and experience. Based on Claude and Shannon's Information theory, Jones (Ascott 2001 pp. 6-10) dissects the mechanical and conceptual elements of information as follows:

> [In presenting information] the communication of a signal [is something] which should be as noise – and distortion – free as possible. But this is information without meaning, syntactical information, simply a matter of the accuracy of the transmission through the communication channel. Nevertheless it is embodied information. But we want to know about the content of the channel, that aspect of information known as *meaning*.

Here Jones distinguishes between a mechanical sense of information and the content of information. This allows for the separation of meaning (experience) from the information. Jones (ibid) goes on to assert "The only way for minds to have any content is for information to be either innate or to be gained by experience." The remaining issues affecting how meaningful experience may be elicited through the interaction between audience and interactive artworks have been discussed with reference to:

1) How experience is formed

2) What constitutes meaningfulness

3) Under what circumstance can the meaningful experience be generated and obtained

Dewey (1997 p.20) makes the important observation that “all principles by themselves are abstract. They become concrete only in the consequences which result from their application”. Hence to this end, forms and levels of meaningful experience and how it could be engendered will be explored more thoroughly in Chapters 6 to 9.

Chapter Five — Evaluation Methodologies and the Initial Analytical Framework

5.1 Introduction

This chapter concerns the rationale behind the establishment of research methods and the prototype of the Analytical Framework. Computer based media is increasingly stretching its tentacles into every corner of our lives; this is reflected in the frequency and duration of people's everyday usage of such media. As a consequence of the pervasive presence of this media multidisciplinary studies are exploring interactions between audiences and users, and between computer artworks and interfaces. This is leading to the development of diverse methodologies which are being introduced into this ever more hybridised research domain. Although research strategies and outcomes from these various studies provide a broad basis for future research, they may not be entirely suitable or directly transferrable to other studies. Candy, Amitani and Blida (2006) state that the first step in constructing a methodology is to define a context. This context is formed by deciding which perspective your investigation could be undertaken from. They borrowed an example originally used by Amitani and Koichi (2002) to develop a structure for musical composition. In musical composition the process has to be analysed so as to identify the elements that inform the structure. Despite the abundance of relevant artistic research evaluating interactive experiences and the extant adjacent methodologies, very few existing models of experience have been developed around freely accessible non-art public spaces, in particular transport hubs.

Birchfield et al (2006) specifically aimed their investigation into the environmental challenges posed to interactive art and the influence of interactive effects on the general public. They carried out a case study with their interactive sound piece *Transitional Soundings*[1], which was installed at a bus transit stop in Temple, Arizona, for a period of six months from September

2005 to April 2006. Through the study they identified a number of issues which may be generally applied to the presentation of interactive artworks in similar public settings. In terms of the artwork itself, weather, vandalism, and vulnerability of electronic parts are major threats. Public safety is the priority for the audience, which in this context is even more essential than for exhibitions in art galleries and museums. Moreover the displays of artwork often have to comply with building and electronic code requirements. In order to lay a foundation for a series of interactive artworks presented on public screens, Bilda (2007) launched a pilot study in Federal Square, Melbourne to evaluate the participants' engagement with a screen based interactive installation *Tango Tangle*[2]. The outcome of the study highlights the nature of the audience within the space. Several interviewees said they felt uncomfortable interacting with the installation at the venue, and suggested that they may have found it easier to interact with the installation in a more enclosed exhibition space.

[1] *Transitional Soundings* was a multiple-user interactive sound installation. Its ripple spreading sound effects are triggered on a mirror like wall inside the bus stop when people came close to the installation. The sound effects became even more dynamic in the presence of several passengers at the venue.

[2] *Tango Tangle* was a screen based interactive installation created by artist Ernest Edmonds. The installation was equipped with a wireless microphone and a 25 x 25 meter LED screen. The changes to the coloured stripes displayed on the screen were influenced by the audiences' tone and volume through the microphone.

The methods applied in the former study were non-intrusive, as only informal nonparticipant and participant observations were carried out with the passengers in situ. This was because the research was primarily intended to uncover the environmental impacts of such artworks exhibited in similar public contexts. On the contrary, the methods adopted in the latter case study were more proactive, as the researchers were concerned with both the participants' perceptual and conceptual state. The researchers invited passersby to take part in the research by asking them to speak or sing through the wireless microphone. The participants were encouraged to ask questions while interacting with the installation. After completion of the interaction session they were asked if they were willing to be briefly interviewed. The interview process was only voice recorded as the researchers were concerned that the participants may not be willing to be seen on a video camera. The five semi-structured interview questions are noted below:

1. Can you please describe what happened when you started speaking/singing to the microphone?
2. What changes did you notice on the screen?
3. What did it make you think of?
4. What did you think it was about?
5. Can you imagine this installation being in another context? What would the context be?

(ibid)

Both studies discussed above seem to be one-offs, as no subsequent research findings in this area had been published prior to completion of this study. However, their methodologies and interview questions provide useful ideas for the formation of a rudimentary research strategy. In constructing a suitable methodology a pertinent analytical research framework has proved crucial for the evaluation, analysis, integration and interpretation of the research findings. Moreover, the framework has been further developed into a practical, conceptual and analytical

instrument to examine both participants' interactive experiences, as well as artworks' performance in similar research contexts. To this end, this review focused on exploring existing research models.

Fels's 'Categories of Embodiment' is an example of such a research model. Fels (2000) proposed the research framework of Embodiment: 1) "the person communicates with the object in a dialogue" 2) "the person embodies the object" 3) "the object communicates with the person" and 4) "the object embodies the person". He applied the framework to examine and illuminate the degree of engagement and depth of relationship between his experimental interactive installation *Iamascope*[3] and the research participants. Fels claimed that a high level of intimacy with the installation will facilitate the audience's communication with the installation through cognition and emotion. Fels (Costello 2005) updated the framework into 1) "Response: object disembodied from self" 2) "Control: self embodies object" 3) "Contemplation: self disembodied from object" and 4) "Belonging: object embodies self". He conducted continuous studies with the *Iamascope*[3] in the 'Beta-Space'[4], a significant research institution dedicated to the study of interactive experience. Fels asserts that his four characteristics are essential to the makeup of successful human and computer interaction systems.

[3] *Iamascope* is an interactive Kaleidoscope that creates images triggered by participants' movements in front of video cameras.

[4] Beta-space is a prominent studio based research environment that is dedicated to the study of interactive experiences between audiences and digital interactive artefacts. It is a collaboration between two Sydney institutions; the Powerhouse Museum, one of the largest museums in Australia which focuses on science, design and history, and the Creativity and Cognition Studios (CCS), a multi-disciplinary practise-led research group in digital media and the arts (Beta-space 2011) .

Fels's framework was conceived in a carefully orchestrated laboratory setting which may not be entirely applicable to other public settings such as the MRT space. Bilda (2007) remarks that: "The real context in which the artwork is experienced can give a greater degree of ecological validity and understanding of situated experience than investigations in the somewhat sterile environment of the laboratory". This highlights why case studies in the actual research contexts of the MRT stations were essential. In order to develop a feasible analytical framework, an extensive literature review was carried out, covering relevant studies of experience, research conducted in laboratory and gallery settings, as well as touching on Human Computer Interaction (HCI). These separate aspects are further analysed in the following sections.

5.2 Relevant Studies of Experiences

One of the objectives (see p.8) of this research is to uncover elements of interactive artworks that may enhance participants' interactive experiences. Hence, it is important to examine existing techniques and theories that have been conceived for evaluation of experiences on related subjects. One of the prominent figures in the field is Csikszentmihalyi; his 'Flow experiences' was first mentioned in a '*Journal Article of Play and Intrinsic Rewards'* (Csikszentmihalyi 1975a) followed by the book '*Beyond Boredom and Anxiety*' (Csikszentmihalyi 1975b). 'Flow' denotes a positive psychological state in which a person is entirely immersed in activities they undertake, while they fully develop a sense of satisfaction through the process of activities. 'Challenge' and 'Skill' are the two major elements of Flow. Csikszentmihalyi and Csikszentmihalyi (1988 p.270) identified eight emotional states based on various ratios of challenge and skill, and further developed an analytical model of experiences; 1) high challenge and average skill (worry) 2) high challenge and high skill (flow) 3) average challenge and high skill (control) 4) low challenge and high skill (boredom) 5) low challenge and average skill (relaxation) 6) low challenge and low skill (apathy) 7) average challenge and low skill (worry) and 8) high challenge and low skill (anxiety).

Another notable study is Eisenberg's (2007) 'Jamming experience', a strategy to facilitate communication between individuals and communities. The four preconditions 1) skill 2) structure 3) setting and 4) surrender are the routes leading to the development of the jamming experience. Firstly, Eisenberg deems a certain level of 'skill' essential to allow interactions to take place in a natural and unselfconscious state, which is instrumental for mingling with a compatible community. For instance, a professional athlete will not fully enjoy play with an amateur. Secondly, a well-defined 'structure' with few requirements is the basis for engendering a sense of community while individual liberation is encouraged. For instance, a musical harmony is reached only when each player in the band plays the same song in the same key, yet

a certain degree of improvisation is needed to enhance the quality of a performance. Thirdly, Eisenberg alleges that ‘jamming’ is very likely to occur in an unusual ‘setting’, where environments are different from the participant’s daily life. Furthermore, obscure self-distinctiveness is a desirable overarching quality as it will improve interactions and assimilations within the community. Finally, surrendering ‘control’ and withholding self-consciousness is an alternative to jamming, as it enables co-evolved interactions with others rather than developing invariable and predictable experiences. The first and last conditions, skill and surrender, are often personal to participants, while the other two conditions of structure and setting are mostly defined and affected by external factors.

Reeves et al (2005) discovered four design strategies by deconstructing various interactivities ranging from using mobile phones, to interacting with interactive artworks, to public performances into two axes ‘Manipulations’ and ‘Effects’. The strategies they discovered were termed: ‘secretive’, ‘expressive’, ‘magic’ and ‘suspenseful’. These strategies were crafted to examine spectators’ experiences of interaction in various public environments, and to fulfil the requirements for interaction in these contexts. 1) Low manipulations and low effects (secretive): interfaces tend not to expose manipulations and effects to spectators in order to prevent them from knowing about the content of the work or to shield the performer from being interfered with. 2) High manipulations and high effects (expressive): interfaces tend to expose and even amplify both manipulations and effects to spectators in order to attract them while allowing them to learn by watching, so as to prepare them to engage with the interfaces. 3) Low manipulations and high effects (magic): interfaces tend not to expose manipulations, nonetheless, in order to attract and impress the spectator the effects are amplified. 4) High manipulations and low effects (suspenseful): interfaces tend to expose manipulations while preventing spectators from seeing the effects, in this case the spectator may be prompted to participate in activities as they watch the performer manipulate and interact, but they are not

able to see the content. Murray's (1997 pp.97-154) three aesthetic principles; 'Immersion', 'Agency', and 'Transformation' can be functional indexes for the analysis of experiences within digital environments, particularly in cyber space. Murray considers these three characteristics essential to creating a sense of pleasure within digital settings. The first characteristic 'Immersion' is a metaphorical term that infers a radical change in mental state derived from participatory activities. The participant is mentally transported to an elaborate, simulated reality while a feeling of pleasure emerges through the process of this transportation. The following characteristic 'Agency' is a sense of delight, which is beyond physical participation. It prompts a person to contribute satisfactory input into a system, with the intention of seeing the outcomes arise as the consequences of their decisions to take particular actions. "When things are going right on the computers, we can be both dancer and the caller of the dance. This is the feeling of agency" (ibid p.128). The final characteristic 'Transformation' is deemed a natural derivative of the digital environment evoking the power of malleability and creation; it allows the participant to unfold the narrative of the system while encouraging them to collaborate with the interaction.

In discourse on the enhancement of interactive and artistic experience within cyber environments, the presentation of interactive arts is not restricted to a single dimension. This presentation often traverses or exists between physical and virtual spaces. Conveying artistic intent upon this interim dimension has attracted artists' interest, and is also an opportunity for artists to master new techniques, materials and spaces. Rogala (2005) proposed eighteen elements of interactive art experience, based on extensive literature reviews integrated with his own analysis. He argues that these eighteen elements are the basis for constructing a basic interactive venue that facilitates developed art experiences. Within the venue, the interactive artwork, (v) user[5] and the artist are fundamental in forming the triadic collaborative presentation.

[5] (v) user refers to the participants who are both the viewer and user. The term was coined by Rogala (2005).

In commercial product design Norman (2005 pp.63-88) breaks down commercial users' experiences into three levels: 1) visceral 2) behavioural and 3) reflective. Norman asserts that these three levels are the key to accomplishing 'emotional design' as they are strategies and premises for crafting successful products. The 'visceral' level concerns the sensory dimensions of how products are perceived. The 'behavioural' level concerns the cognitive aspects of how certain user behaviours form through the use of particular products. The 'reflective' level concerns how consumers sustain their instinct for identifying particular products through long term usage.

The six research models, frameworks and strategies above, informed this study's understanding of theories and instruments that have been proposed and employed in researching interactivity and experience in different public settings. This understanding was then used as a basis for on-going development of a suitable research framework to analyse interactivity in the MRT space. In order to show the correlations between the taxonomies from these analytical models and frameworks, they have been summarised in a diagrammatic form and, based on their features delineated above, are reorganised and categorised into three levels of engagement: 1) Sensory 2) Physical and 3) Cognitive/Integrated (see Figure 5-1).

Author	**Fels**	**Csikszentmihalyi**	**Eisenberg**	**Reeves et al**	**Murray**	**Norman**
Models	**Categories of Embodiment**	**Flow Experience**	**Jamming**	**Designing the Spectator Experience**	**Aesthetic Principle**	**Users' Experience**
Sensory	Response			Effect		Visceral
Physical	Control	Skill	Skill	Manipulation	Transformation	
Cognitive/ Integrated	Contemplation Belonging	Challenge	Structure Setting Surrender		Agency Immersion	Behavioural Reflective

Figure 5-1: Correlations between the taxonomies

In Gallery and Laboratory

There is a substantial body of research concerned with enhancing audiences' interactive experiences and developing studies in both gallery and laboratory settings. Even though these studies have been carried out in similar contexts, the purposes and the implementations of their approaches vary. For instance, some focus on improving the collaborative process between different disciplines, while others look into the feasibility of evaluation methodologies or are intended to reveal potential issues affecting interactivity between participants and interactive artworks. Graham (1997) conducted research on the audiences' relationships with interactive artworks in art gallery settings. Her research aimed to unearth latent issues within interactivity between the participants and interactive artworks. Four case studies formed the main body of her research, while observations of the participants and interviews using questionnaires were her major research instruments. The intention was to compare artists' predictions of audience reactions with the actual perceptions of the audiences encountering the artworks. This was implemented by sending questionnaires to the artists via email and comparing the results with the observation and interview data. The methods employed in each case study were slightly different as new approaches were developed and introduced to further studies.

Morrison, Mitchell and Brereton (2007), aimed to augment engagement with interactive artworks through their research by studying two exhibitions based on 'grounded theory'. The methods applied in the research included: 'shadowing' (non-participant) and participant observation, interviews with the participants through questionnaires at the venues, and sending emails to recruit research participants. Moreover, in order to compare artistic intent with the participants' perceptions of the art installations they also spoke to several artists. Though the two studies were conducted in exhibition spaces, the contexts were distinct. The first one, held at The Block, Brisbane, is an art gallery open to the general public, while the second study was a part of an ACM multimedia event where the research participants were specialists in the field.

Thus Morrison, Mitchell and Brereton (ibid) pointed out that, although the studies with the expert group showed stronger engagement and produced constructive feedback, the outcomes may not apply to the general public.

The research by Höök, Sengers and Andersson (2003), attempted to show that HCI methods can offer benefits which may improve the creation of interactive artworks. Their study researched observers' interactions with the experimental installation *Influencing Machine*. The findings are to some extent a response to artists' concerns about the application of HCI methods to both creation and evaluation of interactive artworks. The study commenced with brief interviews in order to obtain demographic data from the research participants, and to provide participants with basic information on the operations of the installation. During the interviews, the participants were told that their interactions with the installation would be video recorded. After the interaction, the participants were asked a set of questions concerning their experiences of and opinions on the installation. This research model has been extensively utilised in a variety of interactive experience studies in 'Beta Space'[4].

Costello et al (2005) employed Fels's 'Categories of Embodiment' and *Iamascope*[3] as a model for interpreting the procedure of implementation of video cue-recall methods. This was intended to illuminate the viability of the video cue-recall methods[6] in examinations of interactive artworks within 'Beta-Space'[4].Three participants without an artistic background were recruited for the research, where the feasibility of the four characteristics of 'Categories of Embodiment' was also examined. Bilda, Bowman and Edmonds (2008) adopted the same method (video cue-recall) to assess different approaches used in the evaluating processes of engagement, applying these evaluations to enhancing the design of interactive artworks. Additionally, the research involved both expert and novice groups in order to explore and compare different interactive profiles.

Costello and Edmonds (2007) also employed this approach to analyse three interactive installations in 'Beta Space' with the intention of analysing thirteen pleasure categories. They demonstrated the importance of pleasure frameworks in the creation of interactive artworks. Only experts were used as research participants, as the researchers believed that they were more capable of tackling development and conceptual issues. Bilda, Candy and Edmonds (2007) and Edmonds, Bilda and Muller (2009) applied this method to studies of collaborative approaches and issues in the creative process of interactive artworks. The participants included artists, curators, and technologists as well as general audiences.

The discussion in this section brings up various studies which share an ultimate objective of the enhancement of interactive experiences. For instance, Graham (1997) attempted to unearth latent issues which may influence interactivity between the participant and interactive artworks; Morrison, Mitchell and Brereton (2007) examined the factors that may promote interactive engagement, and Höök, Sengers and Andersson (2003) showed how HCI methods could be utilised to improve the creation of interactive art. While these separate studies were conducted either in gallery or laboratory settings, they share a common aim of improving interactive experiences with this study of interactive artworks in public spaces. Therefore the instruments and techniques adopted in the above studies to collect data have been to some extent adapted to this research. Although the adaptation and viability of the methods (e.g. interview, observation, and video-cue recall) required testing prior to implementation in this research, these previous studies offered a starting point that assisted with the progression of this research.

[6] The research participants are told the process of their interaction with the experimental art installations will be recorded beforehand, and they are asked to interact with installations individually in the space without being interrupted by the researcher. During the progress of study the general public is not allowed to enter the space. After the participants complete the interaction session they are taken into a private room, the video of their interactions will be played to them and they are asked to report what were they thinking and doing while they were interacting.

Art Evaluation: Human Computer Interface (HCI)

"In the last decade or so the fields of HCI and interaction design has become less defined by an explicit work orientation regarding the design of technology, and increasingly concerned with issues of fun, enjoyment and aesthetics" (Ciolfi et al 2008).

Computer technologies and devices are pervasively employed in the creative arts. Likewise, the qualities and features of artworks inspire the design and development of various commercial products. Several research projects mentioned above were carried out in conjunction with HCI methods (e.g. Morrison et al 2007, Reeves et al 2005, Höök et al 2003). Moreover, a variety of international institutions in the field have devoted studies to this collaborative and co-educational domain between art, design, science, and computer technologies. For example, Ars Electronica has several HCI experts in their jury panel and HCI research exhibitions on their agenda, while ACM SIGGRAPH incorporate interactive and electronic art shows into their events. The phenomenon has blurred the boundary between the disciplines of art and technology tremendously.

Thus it is clear that artistic practises and HCI methods mutually influence and inspire one another to a degree. However, whether the artistic theories can be directly mounted on a relatively usable and functionality-oriented HCI domain, and if HCI methods can be grafted onto assessment of creative arts, is still in a contentious issue. Paulos (2007) remarked that artists often deliberately repurpose their works to be presented in a malfunctioning state, whereas HCI researchers are extremely concerned about whether their system is precisely and correctly interpreted. He goes on to indicate that "artists are not simply entertainers that must make working systems for users to easily interact with." On the contrary, Petersen et al (2004) pointed out: "when looking into the work that takes an aesthetic perspective on the design of interactive systems it becomes clear, that not all perceptions of aesthetics are equally fruitful as we see a danger in adopting superficial understandings of the aesthetics of interactive systems".

In addition they underlined that the HCI community often concentrate research on numerical analysis, with clear design principles and guidelines. Indeed, several interactive and artistic experience related studies were conducted in laboratory settings and developed based on quantitative approaches. For example Höök et al 2003 and Bilda et al 2006 measured the duration of time that research participants spent interacting with the experimental installation and used the findings as references to determine the level of engagement. Candy, Amitani and Bilda (2006) recorded the times when a certain action or response appeared and applied the results to build their coding scheme. However, this approach is rarely utilised in art research since artists may not be keen to quantify the results of their research, instead adopting a qualitative approach.

Though her original intention was to show the importance of combining methods of observation and interview for the study of interactive experience, Graham (1997) illustrates a number of factors which may affect the amount of time that the participants spend with artworks. These factors include: if the artwork is interesting, if other people are queuing, waiting to experience it, and the amount of time participants require in trying to discover the meaning of the artwork. Moreover, audience members might also be thirsty, have restless children, be self-conscious or may find the content of the artwork boring or offensive. The influence of these personal (subjective) and external (objective) variables in audience experience is dramatically increased when examining artworks in open public contexts, such as in the MRT stations. While factors such as the number of passengers entering or leaving stations may not be of major significance, they nonetheless affect research. As the discussions above shows, the issue is, to some extent, similar to the definition of interactivity in art genres. As with these disputed definitions, there is no sign of a settlement to the issue, since similarities and divergences coexist between the two disciplines. Additionally, the disciplines are in a state of mutually connected development. However, it is not necessary to explore this debate in depth here as it is not the subject of this

research. The literary reviews of this field have been used to identify appropriate resources to be used in structuring initial research methodologies and an analytical framework. Together with previous literature reviews on interactivity, meaningful experience, and play in interactive art and play commonly associated with video games, the findings at this stage of research have proved sufficient to fulfil the requirements of this study.

5.3 Forming the Initial Analytical Framework

The findings of the literature reviews suggest that in order to obtain valid information and in-depth understanding of a situated experience, it is vital to investigate the experience within the real context where the experience occurs. Thus the first step in embarking on this stage of the study was to construct an adequate research strategy that was applicable to this research context. A brief impression of the ways passengers engage with the interactive art evolved through several informal field observations at very early stages of this research. It appeared that although the passengers were attracted by responsive multimedia effects, some even wandering around the spaces attempting to figure out the trigger of the responsive effects, the majority of passengers' reactions to the effects were not clearly outwardly expressed. Many merely paid visual attention to the artworks without reducing their walking pace. These trends in audience behaviour prompted three rudimentary research questions:

1) What prompts the participant to engage with the artwork and by what approaches enabled them to enter the art context?
2) What may assist the participant in attaining a personal meaningful experience through physical interaction with the artworks?
3) What is capable of prolonging the participants' attention, intensifying their curiosity and urging them to further engage with the artworks?

Combined analysis of the existing research frameworks, models, and strategies has shed light on this initiative to formulate an initial Analytical Framework: 1) **Dominance Transfer**, 2) **Mind-Orientedness**, and 3) **Accessible Challenge** (see Glossary, p.xiii).

Repeated examinations of the existing frameworks and models, involving deconstruction, classification and analysis of the components, led to the development of the above three characteristics. This was a necessary preparation for the next phase of research. Fels's first and second embodiment characteristics, response and control, are essential elements in the loop of interaction. Discernable feedback is explicitly shown to the participants to arouse interaction with the artwork, and through to-and-fro interactions the participant develops a sense of control. This study classifies the combination of these elements under the first characteristic '**Dominance Transfer**'. Fels's 'Contemplation' is incorporated within the broader of concept of this study's second characteristic, '**Mind Orientedness**', as it is a component that leads to the development of communication between audiences and artworks. Fels deems his final characteristic of Belonging, from which the participants derive a sense of unconsciousness during the interaction and feels like they are a part of the installation, the most difficult to accomplish. The concept, to some extent, resembles Csikszentmihalyi's 'Flow', Murray's 'Immersion' and Eisenberg's 'Surrender'. While the appropriate conditions for these experiences are often difficult to generate they can be realised with the right structure and setting. These similar characteristics are organised into this study's third characteristics '**Accessible Challenge**', as they can be employed as strategies to intensify engagement.

Fels's 'Categories of Embodiment' can be completely merged into this study's engaging characteristics, as they are designed to gauge the interactive experiences and performance of interactive art. However, several other research models that also inform this study can only be partially correlated to the initial Analytical Framework as they were devised for other research

purposes. The diagram below shows the correlations between the three engaging characteristics (Dominance Transfer, Mind-Orientedness, and Accessible Challenge) and the taxonomies from the previously examined analytical models and frameworks.

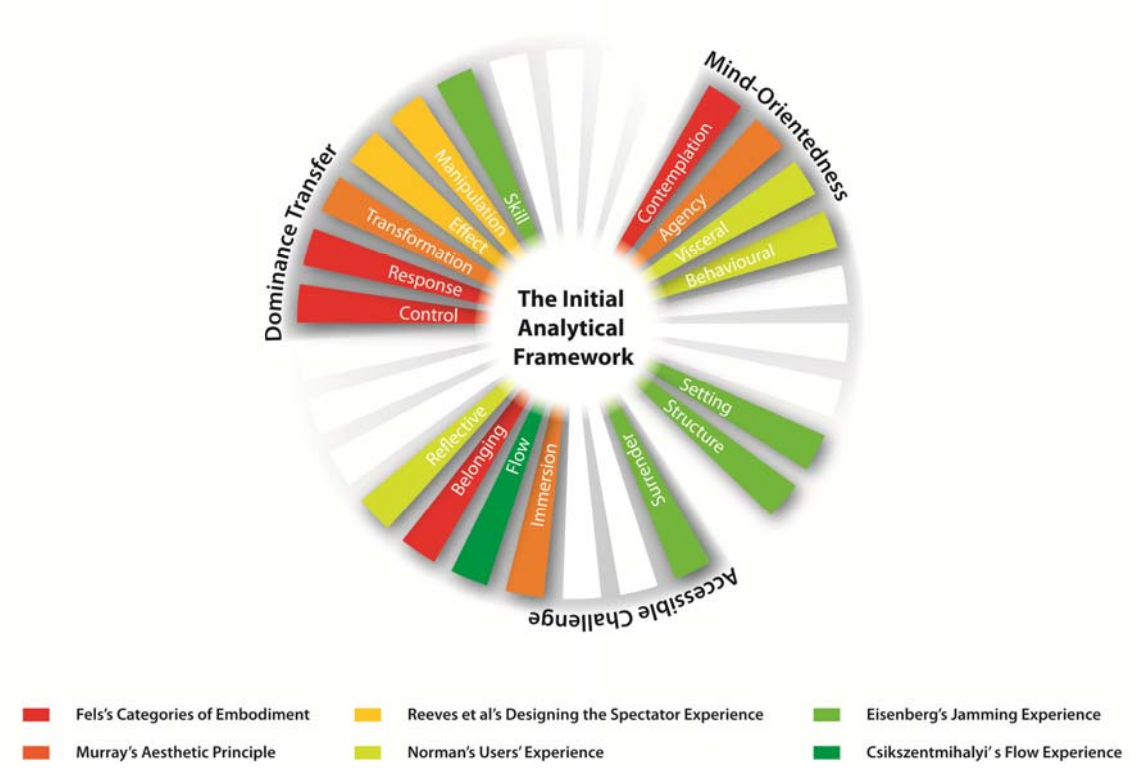


Figure 5-2: Correlations between the initial Analytical Framework and some taxonomy

5.4 Forming Evaluation Methods

The major techniques and instruments utilised in the various interactive experience studies discussed above include: observations, interviews with and without questionnaires, and case studies, together with various methods of recording the research process such as video cue-recall and voice recording. Multiple methods were often implemented to ensure reliability of results. Graham (1997 p.49) notes that a "hybrid approach is suggested in order to obtain useful pointers from case studies as opposed to attempting comprehensive answers of dubious reliability". Chang (2006) in her research of '*Users' experiences in interaction with web pages*' alleged there is no single method which can contend with complexity inherent in the study of users' experiences. Flick (2007 p.37) indicates "The different methodological perspectives complement each other in the study of issue, and this is conceived as the complementary compensation of the weaknesses and blind spots of each single method." Developing a suitable methodology for the study of interactive art exhibits in public spaces raises complex challenges; in particular as few studies have been conducted in similar public contexts. However the methods applied in those contiguous studies do provide references for the construction of a systematic methodology.

Observation

The use of observation as a research method for the study of interactive experience has been discussed by other works explored in the literature review. Edmonds, Bilda and Muller (2009) stated that: "The best way to gather information on such interactive behaviour is to observe, analyse and learn from various audiences' experiences as they occur in real-time". Graham (1997) notes that observation is an adequate starting point for such research. Observation is essentially divided into nonparticipant and participant types (Sarantakos 1994, Flick 2007). Researchers in nonparticipant observation are unnoticed by and do not interfere with the people and contexts studied. This approach allows the researcher to construct an understanding of

audience activity in the early stages of the research settings. Adler and Adler assert (cite in Flick 2007 p.216) “Simple observers follow the flow of events. Behaviour and interaction continue as they would without the presence of a researcher, uninterrupted by intrusion”. In participant observation, the researchers conduct observations from inside the research context, ideally withholding their identity. This allows researchers to obtain information on how people’s experience progresses, the process of activities and problems within the research context. Participant observation also allows researchers to develop an understanding of audience’s attitude towards the artwork and their experience of the artwork in research context (e.g. Sarantakos 1994, Flick 2007).

Interview

Gray and Malins (2004) note that interview is an approach that can unearth notions and opinions of research participants toward specific research topics. The researchers construct and initiate dialogues deliberately focused on issues vital to their studies. In order to obtain objective opinions allowing comparisons of different experiences and views, the interviewees in this research were separated into three groups: the passengers from the MRT stations, the members of the MRT artworks selection committee, and the artists who created the artworks. This same method was utilised by several earlier studies (Graham 1997, Bilda et al 2007, Edmonds et al 2009). Instead of seeking short, concise answers through methods such as opinion polls; the interviews in this study were intended to encourage the interviewees to express their views toward specific research issues. Flick (2007 p.149) points out that semi-structured interviews are widely used to this end, stating that with this method “the interviewed subjects’ viewpoints are more likely to be expressed in an open designed interview situation.” Burns (2000) highlights the flexibility of this approach, stating that semi-structured interviews often involve both structured and unstructured elements in both the interviewing process and the interview instruments. For instance, in this research the interviews were conducted in a structured mode as

the interviewees were given the same questions in a specific order. This was done in order to elicit more representative opinions on specific questions and to ensure that the results of the interviews were comparable by minimising variables that would affect the interviewee's answers. Overall, the interview questions combined unstructured and semi-structured formats. Examples of structured and unstructured questions are given below:

> "unstructured questions (e.g. "What impressed you most in this film?")", […] "semi-structured questions, either the concrete issue (e.g. a certain scene in a film) is defined, with the response left open (e.g. "How did you feel about the part describing Jo's discharge from the army as a psychoneurotic?"), or, the reaction is defined and concrete issue is left open (e.g. "What did you learn from this pamphlet which you hadn't known before?")" (Flick 2007 p.150).

Case Study

Gray and Malins (2004 p.197) describe a case study as follows: "the in-depth study of a particular example, usually a person, for example an artist or designer, or a project; rich in detail and context bound, the case study attempts to present a complete picture, usually by the use of multiple research methods". Candy, Amitani and Bilda (2006) argue that in a case study "The researchers need to be able to arrive at a grounded interpretation of the significance of what is taking place to a relevant audience". As a context oriented measure, case studies play a pivotal role in this research. They are intended to elicit diverse behaviour patterns at the research venues, allowing evaluation of different behavioural profiles and the subsequent uncovering of other features and issues pertaining to the research questions. In addition, unlike experimental art installations set up in controlled research settings such as 'Beta-Space'[4], the artworks presented in the MRT spaces are usually fixed and non-amendable artworks. Contrastingly installations in laboratory studios are normally prone to modification in accordance with the

needs of various research purposes. Paulos (2007) makes a note of the fixed nature of works installed in gallery spaces, which can be loosely compared with those in MRT contexts as both are finished products: “The work they create is almost always considered complete as declared by the artist and not up for re-design and modification at whim of gallery users”. Therefore, case studies play an indispensible role in this research in examining different models of experience within different interactive interfaces and mechanisms.

Video and Audio Recordings

Within this field, video or voice recorder devices are commonly considered supplementary research instruments for interviews. Burns (2000 p.429) highlights one of their advantages stating “not having to take notes enables the researchers to take part in the conversation in a natural way.” Nevertheless, Burns (ibid) also indicates that when using such devices, not only will transcribing raw data from the recordings be a laborious and time consuming task, but there will also be concerns over ethical issues of participant consent for the use of the recorded information. This highlights the importance of notifying the participants prior to starting interviews that recording devices will be employed in the interviews, and explaining that this is to facilitate the process of the interviews.

5.5 Summary

As has been discussed above there are an ever increasingly wide range of variables in this research context. Moreover, the research can also be affected by diverse environmental and human factors, such as audiences, locations and weather. As it is difficult to draw any rigid conclusions, findings from studies in this research should be regarded as what Graham (1997) called ‘hypothesis generating activities’. They are not intended to establish absolute concepts and definitions, instead they are intended to offer context specific data and subsequent findings developed from this data.

These research findings provide valuable references for people involved with and undertaking similar art practises. As no research similar to this study has been identified within ongoing reviews of literature, it was necessary to test the proposed methodologies prior to applying them to the case studies. This helped ensure the viability of the research methods. Knight (2002 p.80) remarks “mistakes that have got embedded in a questionnaires or measurement scale are expensive. Piloting is the best way of reducing the chance of making them. Piloting also helps you to find out how best to present the instruments to participants.”

To avoid the potential pitfalls highlighted above two pilot studies were conducted. These informed methods of approaching the potential interviewees (the passengers) and helped this study to avoid errors that would have influenced the subsequent case studies in the MRT stations through misuse of methodologies. The outcomes of these pilot studies not only shaped the later research methods and brought to light the characteristic of ‘Playfulness’, but also proved to be a valuable point of reference in assisting selections of appropriate artworks for research in the MRT stations. The full details of these pilot studies are found in the Appendix ii pp.13-29.

Chapter Six — First and Second Case Study in the MRT Stations

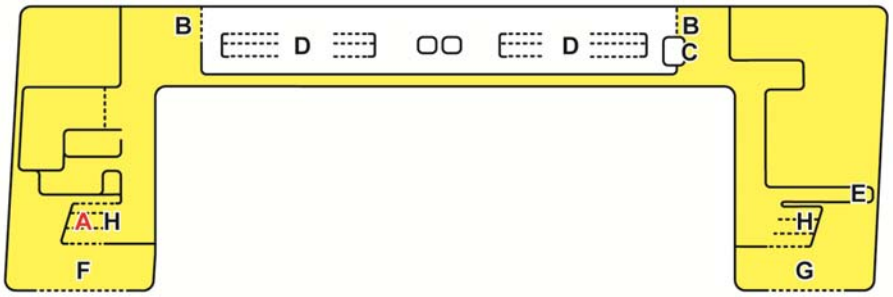
6.1 Introduction

This phase is (Phase 2, see pp.11 and 14) comprised of two case studies in different MRT stations together with two supplementary studies in art galleries (see Appendix ii, pp.30-38). The first case study was carried out with the art installation *The Legend of the Phoenix*. The study was intended to reveal the participants' perceptions and reactions when encountering interactive artworks in MRT stations, and to analyse interactive behavioural features through the 'initial Analytical Framework' (see Glossary, p.xiii). The supplementary studies were conducted with the author's own interactive installations *Event Horizon* and *Wonderscope* (see Appendix vi, p.152). The studies with these two artworks provided opportunities to observe different forms of interaction and to examine the functionality of the initial Analytical Framework in examining interactive experiences in different public environments. Although the findings from these two studies allowed comparison of interactive experiences between different public settings and produced useful references, the details of the studies are enclosed in the Appendix (Appendix ii, pp.30-38) as the artworks created for these studies were not the primary focus of this research. The findings of the pilot studies (see Appendix ii, pp.13-29), the first case study, the supplementary studies and the literature reviews were analysed in order to improve the consistency and clarity of the language used in this study's terminology. This led to an amendment of the 'initial Analytical Framework' to Play, Transfer, Accessibility and Challenge. These four updated characteristics were subsequently applied to the second case study to examine the artwork *Poetry on the Move*. The objective of the second case study was to continue the investigation of different modes of interaction, in order to ascertain which behavioural patterns were more or less prominent in this context, and to identify new behavioural patterns. It was expected that the findings from this phase of research would further inform the Analytical Framework, perhaps by revealing a new characteristic.

6.2 First Case Study: *The Legend of the Phoenix*

The first case study was carried out with the installation *The Legend of the Phoenix*. This artwork has been exhibited at the Kaohsiung's Fongsan West MRT station (see Figures 6-1-6-3) since 2008. The study was conducted for a period of three days, four hours per day, starting on Monday 9th March 2009.

This interactive artwork is made from articulated stainless steel pipes and is suspended beneath the ceiling inside the station near exit one (see the map of the station, Figure 6-1). A video-camera sensor used to detect passengers' movements within the space is also installed underneath the ceiling about half a metre away from the installation. Eight rotating stainless steel maracas are attached to the ends of the pipes which are triggered when passengers pass beneath the art installation. The shape of the art installation symbolises the legend of Fongsan City (Fongsan in Chinese means Phoenix Mountain). The streamlined phoenix shaped installation resembles Chinese calligraphy. It is not only made to incorporate locally relevant cultural values, but also to elicit a sense of attachment from the passengers towards their hometown.



Fongsan West MRT station concourse level plan							
A	*The Ledged of the Phoenix*	**B**	Entrance	**C**	The ticket office	**D**	Escalator to the platform level
E	Elevator	**F**	Exit one	**G**	Exit two	**H**	Escalator to the concourse level

Figure 6-1: Fongsan West MRT station concourse level plan

Figure 6-2: *The Legend of the Phoenix*

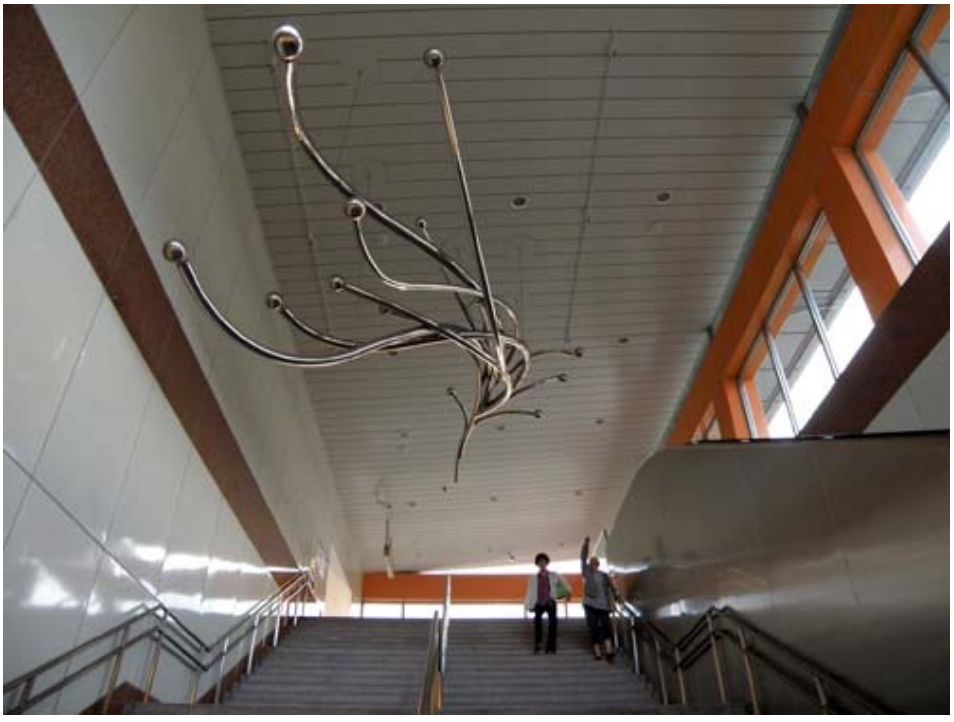


Figure 6-3: Passenger pointing at the artwork (*The Legend of the Phoenix*)

Methodology

Due to the low retrieval rate of the questionnaires in the second pilot study (see Appendix ii, pp.19-29), the strategy by which the questionnaires were used was altered. Instead of asking the interviewees to fill in the questionnaires they were given a copy of a reusable laminated questionnaire, and their answers were recorded using a digital voice recorder during the interviews. The participants were approached after it was clear that the artwork had attracted their attention, for example when they watched or pointed at the installation (see Figure 6-3). After the participants agreed to be interviewed, they were given a copy of the questionnaire, while I had an identical copy. The participants were told that they did not have to fill in the questionnaires but were only required to answer the questions orally, as the digital voice recorder would be used during the interview. It was explained that the interview proceeds quicker with the voice recorded as they would not have to write anything. The interviews only took place once the participants had consented that their voice could be recorded.

By the end of the three-day case study, fifteen passengers had been interviewed at the station. The research was developed based on a qualitative approach. In-depth studies are usually carried out in this way, with relatively small numbers of participants (Patton 2002, Maxwell 2005, and Silverman 2009). According to Patton (ibid p.244) “In-depth information from a small number of people can be very valuable.” Thus instead of summarising large numbers of research samples, this study based its findings on personal and in-depth responses from each of the fifteen interviewees at each of the MRT stations. This proved highly productive as they provided ample and wide ranging responses. Moreover each interviewee selected for the study had displayed a degree of interaction with the artwork. This was important since interaction is one of the key criteria for meaningful experience in this research context, as the interaction develops from a certain level of physical involvement (Dominance Transfer), ‘meaningful experience’ is unable to develop without physical interaction.

Thanks to the prior pilot studies; the proposed methodologies were successfully and fully implemented in this first case study. In addition to the amendment to the use of the questionnaires, this first case study also differed from the pilot studies in the way discussion was initiated with the participants. In the pilot studies, the participant observations and interviews often began by mingling with the participants by discussing the installation with them. In the Fongsan West MRT stations, the interviews proceeded fairly straightforwardly, often starting by articulating my intention to approach them with a short introduction of myself, for instance explaining, 1) who I am (showing my student ID to the interviewees) 2) the purpose of conducting the interview 3) why they were selected to be interviewed and 4) how much time would be spent on the interview. This approach proved effective in increasing the willingness of the passengers to be interviewed, since they understood the interview was for genuine research.

The participants answers were given verbally and their responses were recorded. This method was modified from 'Thinking aloud' and 'Video recall' (see p.112) techniques. Instead of asking the participants to watch the videos, I encouraged them to examine and comment on the artwork. This approach made the interview process more efficient, which was necessary as most participants were unwilling to spend too much time being interviewed: several participants asked how much time the interview would take before starting the interviews. Although the responses to the interview questions were mostly a few sentences, the use of the voice recorder was beneficial in that it allowed them to speak freely in interpreting their interactive experience. Furthermore I was able to encourage them to be more detailed, which in some cases led the participants to further test the artwork. This approach maximised the smoothness and productivity of the interview process.

By summarising the responses directly below each interview questions, the 'Summary of Response to Question (number)' section provides lucid indications on which engaging

characteristics are reflected in the interview findings. The dialogue section visualises interrelation between the interview findings and the each characteristic. The content of the interviews is succinctly quoted and diagrammatically analysed (see Figure 6-6) at the end of this section. More comprehensive interview transcriptions are provided in Appendix iv.

Observations in the Field

The artwork (*The Legend of the Phoenix*) is seen when the passengers enter the station from exit one. Their attention is instantly caught by the scale, elegant shape and lines of the artwork. The artwork remains in a silent and inactive when no movement is detected within the space. The maracas start rotating triggering a sound when the passengers move close to the stairs from exit one and when they are on the escalator approaching the top. The passengers were attracted by the responsive acoustic effects, as the sound can be heard when the passengers are at the bottom of the escalator or stairs prior to viewing (see Appendix i, Figure 19).

Many passengers on the escalator looked and pointed at the art installation, a number of people walking on the staircase even stepped back and forward to watch the rotating maracas and attempted to discern where the sound was coming from, others discussed the art installation with their partners. Nevertheless, despite the responsive acoustic effects that prompted an interaction between the passengers and the artwork, during the three-day field study none of the passenger approached location 'A' to read the artwork introduction (see Figures 6-4-6-5). Only two passengers accidently walked there as they thought the monitor[1] was a rubbish bin. This suggests that passengers in such spaces are unlikely to spontaneously seek the meaning of an artwork. Moreover, it to some extent illustrates a failure to further engage the passengers.

Figure 6-4: Exit one (the artwork introduction at location ‘A’)

Figure 6-5: Exit one (Location ‘A’, the artwork introduction)

[1] The monitor displayed silhouettes of the passengers within the sensor detecting area.

Dialogue with the Passengers

Prior to conducting formal interviews with the passengers, non-participant observation was the only method applied in several informal field studies in the Fongsan West MRT station. This helped ascertain the passengers' activities and routines within the space, their responses to the art installation and helped determine appropriate timings for the case study. After obtaining a basic understanding of the general activities in the venue, 5:00pm - 7:00pm was identified as optimal timing for the field study.

The main concern was that as the station is located near schools and residential areas, the passengers would generally be either students on their way to school, or people using the MRT to commute between home and work. Outside of rush hour, the station remained relatively quiet and only a few people entered and left the station. Therefore I decided to conduct the majority of the study in the late afternoon, a time which I considered the most suitable for finding potential and willing interviewees. However, in order to obtain broadly representative opinions, the second field entry hour was not specifically set and it was conducted for approximately two hours, between 11am and 8pm.

Interview – Question 1

The passengers at Fongsan West MRT station displayed less physical interaction with the work than the participants in the second pilot study (see Appendix ii, pp.19-29). However, the majority of the interviewees at Fongsan West station indicated that they were attracted by the acoustic effects and shape of the artwork. The interviewees were asked to describe: *Why the artwork draws their attention and which part attracts them the most?*

Summary of Response to Question 1

While the shape and kinetic nature of the artwork caught the passengers' attention, the acoustic effect of the maracas was the most potent element. This triggered curiosity and encouraged the passengers to seek the source of the sound. Though their movements were moderate, playful and explorative, the responses indentified were similar to those which occurred in the second pilot study, which were evidently features of **Playfulness** (see Glossary, p.xiii).

Interview – Question 2

During the study, none of the interviewees were seeing the artwork for the first time at that moment, they had seen it previously and several saw it every day. They were asked: *To recall and describe their feeling when they saw the installation for the first time*.

Summary of Response to Question 2

The majority of the interviewees gave positive responses (e.g. interested and curious) on their first experience of encountering the artwork. Similar to feedback from the first question, the responsive sound effects triggered **Playful** and explorative reactivity and were the major element in their impressions of the work. Additionally, one interviewee (FS09, see Appendix iv, pp.78-80) reported the rotating maracas and sound initiated discussion between him and his classmates for a while, which partially manifests the characteristic of '**Accessible Challenge**' that prolonged their curiosity and attention.

Interview – Question 3

Through analysis of the first and second (questions) interview content, it can be seen that, although the **Playfulness** phenomenon was not explicitly displayed, it did exist. The sound effects provoked the participants' curiosity, leading them to seek the source. Nevertheless, this implicitly **Playful** reactivity raised the question of whether the majority of the passengers are

able to or have figured out the interactive mechanism, as this could be a crucial factor influencing motives for further exploration and reveal the narratives of the art piece. The interviewees were asked: *Do you know how the installation worked, and if you do not, have you ever attempted to understand how it worked?*

Summary of Response to Question 3

The interview outcomes show that the majority of the interviewees did not know exactly how the art installation worked. Although almost all of them indicated that they were curious about the mechanism behind the rotating sound, in most cases the passengers behaved indifferently and no follow up actions were made. The responses imply that their curiosity was stimulated which verges on **Accessible Challenge**. However not all of them tried to understand the mechanism of the reactive effects. This suggests that their curiosity was not sufficiently sustained. This might be a result of insufficient potential for **Dominance Transfer**, as the participants were unaware that they were the trigger of the reactive sound effects. A similar phenomenon was also indentified in the first pilot study.

Interview – Question 4

Despite interviewees' indication that they did not know the meaning of the artwork and the interest expressed in its meaning, they did not, actively seek the answer. The interviewees were asked: *Does the representation of the art installation prompt you to explore the meaning of the artwork?*

Summary of Response to Question 4

None of the interviewees were aware that an introduction to the artwork was displayed not far from the artwork and they did not spontaneously look for the information on the meaning of the artwork. This might be the result of a lack of both **Dominance Transfer** and **Accessible**

Challenge. The reason for the absence of **Dominance Transfer** was discussed above. With regards to **Accessible Challenge**; as no further explorative phenomenon proceeded the participants' curiosity was obviously not intense enough. Of the interviewees from the field study, only two knew the meaning of the artwork: one was an art college student, and the other had seen the MRT artworks introduction pamphlet issued by the Kaohsiung city government.

Interview – Question 5

Although the interviewees did not know the artwork was an interactive piece and were unaware that the artwork introduction was displayed not far from the artwork itself, several of them were still able to apprehend the meaning of the art within its broader context. The interviewees were asked: *Can you tell the meaning of the art represented?*

Summary of Response to Question 5

Due to lack of **Dominance Transfer**, the meaning and interplay quality of the artwork were not fully displayed. However, the combination of sound effects and the shape of the art installation triggered the passengers' consciousness of their hometown. This highlighted the features of **Mind-Orientedness**. Many interviewees developed their own associations with the artwork and reported that they felt the form of the installation had some sort of connection with the place. Some also indicated that they could tell the installation resembled a phoenix and were interested in finding out the meaning of it.

Analytical Framework	Order of the Questions	Response of the interviewees (FS number, (sequence of being interviewed))
Dominance Transfer	Q3:	- I do not really know (FS01). - To be honest, I do not know (FS06). - I do not know but I am very curious about it […] (FS07) (void of Dominance Transfer)
	Q4:	- I do not know actually […] (FS03) - I do not quite understand it […]FS09) - It is very cool, but to be frank I do not know what this work is trying to represent […] (FS10) (void of Dominance Transfer)
Mind-Orientedness	Q5:	- I wondered if it has some sort of association with time or train schedules, something relating to the MRT maybe (FS07). - The sound was like the call of a phoenix [The interviewee has seen the artwork introduction before] (FS08) - It seems to represent the features of Fongsan city, […] by only using a few simple lines it is able to portray the idea of Fongsan (FS12). - I think there is a start point at the beginning […], and the rest of the lines stand for the condensed MRT network, maybe a vision of the future MRT network (FS15).
Accessible Challenge	Q2:	- We kept guessing how the installation worked, especially the rotating things, we were continuously talking about that for quite a while (FS09).
	Q3:	- I am very interested to know how it works (FS01). - I have asked some people but no one knew (FS06) - […] so I always look at it when ever I pass here (FS07).
	Q4:	- […] if there was an introduction to the artwork that would help (FS03). - […] I have never really thought about it (FS10). (void of Accessible Challenge)
Playfulness	Q1:	- I wondered how it worked (FS04) - that rotating sound made me wonder if the sound was played regularly (FS07) - which prompted me to lift my head to look at the installation (FS08)
	Q2:	- I was curious about where the sound was coming from, and then I discovered something was rotating (FS07). - We were wondering, do those balls rotate autonomously or what? (FS09) - It starts rotating when people are coming down, so I felt it was like something was watching us (FS12).

Figure 6-6: Correlation of the four initial engaging characteristics and the responses of the passengers

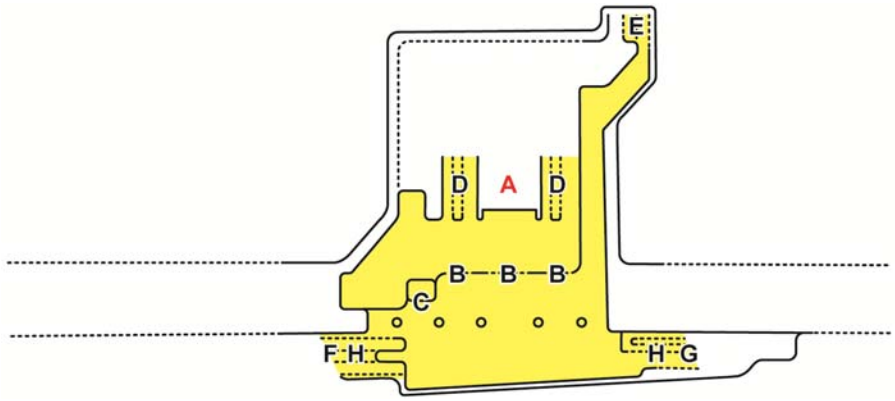
6.3 Second Case Study: *Poetry on the Move*

The second case study was conducted with the artwork *Poetry on the Move*, which has been exhibited in the Taipei Fuzhong MRT station since 2005. The study was carried out for a period of three days with four hours in each field study, starting on Tuesday 23 March 2009.

Poetry on the Move is an interlacing ribbon shaped interactive LED bulletin made of stainless steel hung underneath the ceiling of the main atrium of the station. Since the installation is situated in a very central space, it can be seen by passengers regardless of whether they are entering or leaving the station. A number (0911511026) to send text messages to the LED display is intermittently shown on the art installation, inviting the passengers to interact with the installation by contributing messages to be displayed on the LED bulletin, while at same time, share their thoughts (messages) with people in the station via the art installation.

The artistic intent of this art piece is to turn the station into a more humanised space by prompting dialogues between people, and between people and the space. The ideal messages are short pieces of poetry, or messages that the passengers would like to share. In order to prevent potential malicious utilisation of the art installation, a warning phrase[2] is displayed regularly; additionally an indecent language censoring system is programmed in the installation.

[2] The Taipei MRT Corporation reserves the right to prosecute those liable for any damages or inappropriate texts being displayed to the bulletin board.



Fuzhong MRT station concourse level plan			
A *Poetry on the Move*	**B** Entrance	**C** The ticket office	**D** Escalator to the platform level
E Exit three	**F** Exit one	**G** Exit two	**H** Escalator to the concourse level

Figure 6-7: Fuzhong MRT station concourse level plan

Figure 6-8: *Poetry on the Move*

Figure 6-9: *Poetry on the Move* (level 2)

Figure 6-10: ‘A’ and ‘B’, the introduction of the artwork is displayed at these two locations

Methodology

The methodologies employed in this study were essentially the same as in the first case study, apart from slight alterations to the order and content of the questions in the questionnaires. This case study did not ask any questions concerned with physical responses to the artwork. The findings of non-participation observations indicate that the passengers might be unaware that the bulletin is an interactive artwork. The amended Analytical Framework (see p.124) was employed in examination of the feedback. The features of the engaging characteristics manifested in the responses are analysed and summarised below each dialogue section. In addition, as in the first case study, interview content which matches the features of the characteristics is succinctly quoted in the matrix at the end of the dialogue section and a more comprehensive transcription can be found in the Appendix (see Appendix iv, pp.81-83).

Observations in the Field

The modern, interlacing ribbon shape design, flowing texts on interactive LED bulletins and its central location allow the installation to be seen from all three stories of the station and attract the passengers' attention. Although the messages on the art installation were flowing fairly fast, occasionally passengers on the escalator or stairs lifted their heads to watch it. However, they often appeared to be appreciating the artwork aesthetically rather than reading the messages.

The station is a three-story underground construction; B1 is the station main entrance level, B2 and B3 are the platforms. The installation can be seen from all three floors, though the best place to view the art installation is at B2 as it can be seen from eye level. However, when the passengers stepped off the stairs or escalator, most of them moved directly toward the train waiting zone (there are approximately 16 metres from the railings to the waiting lines). Only a small number of passengers lingered around the railings near to the LED bulletin, mainly speaking on their mobile phones or chatting with their friends and rarely paying attention to the

artwork. Similarly, when passengers arrived in the station they also headed straight towards the exits. Although many of them did glance up at the art installation either on their arrival or departure, very few of them stopped to watch the art installation. Additionally, within the three-day case study none of passengers walked to locations of A and B (see Figure 6-10) to read the introductions. Overall, no physical interactivity was generated between the passengers and the art installations in the Fuzhoung MRT station, though many passengers glanced at it and a few slowed their pace to watch the LED bulletin. Despite the paucity of interactivity, these short periods of attention yielded the research opportunities necessary for the interviews and studies.

Dialogue with the Passengers

After completing several non participant observations at the station, the optimal study time was identified as 5:00pm - 7:00pm. While there are considerable difference in transport capacity[3] between the two stations (Fuzhong and Fongsan West MRT stations), and the presence of shopping areas in the vicinity of Fuzhong station, the attributes of the two stations share certain similarities. The passengers were generally either students going to school or people using the MRT travelling between home and work. Therefore, the major field study hour was set in the late afternoon. After rush hour the number of passengers in the Fuzhoung MRT station was higher than those in the Fongsan West MRT station, offering a more flexible field study time arrangement, although the second field study hour was not specified, the desirable period was wider, from 9am to 9pm.

[3] According to the statistics from the Taipei Rapid Transit Corporation and Kaohsiung Mass Rapid Transit, the monthly transport capacity of the blue line of the Taipei MRT in September 2010 was 37,147,000. The orange line of the Kaohsiung MRT in September 2010 was 3,205,344. Currently, there are 21 stations on the Taipei MRT blue line, Fuzhoung station is of the stations on the route. Whereas there are only 14 stations on the Kaohsiung MRT orange line, Fongsan West station is on the route (Metro Taipei 2010 and KRTC 2010).

Interview – Question 1

The ubiquitous indifference toward the LED bulletin led this study to question whether the passengers were aware that the LED bulletin was an interactive artwork. The interviewees were asked: *Do you know what this artwork can do?*

Summary of Response to Question 1

As the non-participant observation had indicated, the majority of the interviewees were unaware that the LED bulletin was an interactive installation. Many of them thought it was just a smartly designed LED bulletin. In general, the passengers passed by the installation quickly, either walking towards exits or the platforms. Although several had glanced at the bulletin, only very few of them slowed their pace to watch it. However, the responses from the interviews indicate that the passengers did not really pay attention to the content of the bulletin, and, as a result, no interactivity was generated and no engaging characteristic emerged.

Interview – Question 2

Despite the participants being initially attracted by the presentation of the LED bulletin and the flowing texts on it, they were not as engaged as the passengers at the Fongsan West MRT station. Prior to telling the interviewees the functions of the artwork, I asked: *Would you try to figure it out how it worked?*

Summary of Response to Question 2

It is evident that the ‘setting’ in which artworks are exhibited influences the way in which passengers engage with them. The majority of interviewees showed a lack of interest in understanding the mechanisms of the LED bulletin. Many expressed that they were not particularly concerned with how the bulletin worked or they did not have time to explore this. This may result from insufficient stimulus and a lack of immediate, on the spot, interactive responses. Thereby no explorative phenomenon was engendered; only short and scattered visual

attention was paid to the art installation, which led to no engaging characteristic being discerned.

Interview – Question 3

In an attempt to uncover what could be potential elements to capture passengers' attention, the interviewees were asked to: *Describe why the artwork draws their attention and which part attracts them the most?*

Summary of Response to Question 3

Thus far, I had yet to inform the interviewees that the bulletin was an interactive installation. Apart from the fast flowing messages displayed on the bulletin, as mentioned above, there were no clear responsive effects or sufficient clues to provoke spontaneous interactions from the passengers. I tried to encourage the interviewees to take action and explore the artwork further, but by and large they showed a lack of interest in exploration and were not very keen to figure out how the art installation worked. Again, as a result of this, no feature of interactivity was highlighted.

Interview – Question 4

The first five interviewees (FZ01~FZ05) were asked question four prior to revealing to them that the LED bulletin was an interactive artwork. The final ten interviewees (FZ06~FZ15) were informed of the mechanism prior to conducting the interview, as the first five could not answer question four properly because they were unaware of how the LED bulletin worked. The interviewees were asked: *Can you tell the meaning of the art represented? Does the representation of the art installation prompt you to figure out the meaning of the artwork?*

Summary of Response to Question 4

Features of the four engaging characteristics began to be revealed after I told the interviewees that they could send messages to the LED bulletin. The interactivity between the artwork and participants became apparent which lifted both '**Transfer**' and '**Play**' as the interviewees started to test the art installation, some even tried sending messages during the interviews and a couple of interviewees asked how much it cost to send a message to the bulletin and how long would it take to display the messages on the bulletin. The participants' attention spans were undoubtedly prolonged and intensified. Moreover, they were able to guess the intent behind the art piece, which brought up the characteristics of '**Challenge**' and '**Accessibility**'. There was substantial variation in the degree of interaction evident before and after the interviewees were told how the installation worked. This result suggests that a sufficient incentive is of great importance when presenting interactive artworks in the MRT space.

Interview – Question 5

In order to obtain the passengers' opinions on possible improvements to the interactive mechanism of the art installation, the final question posed to them was: *If you were the artist who created this artwork, which part of it you would have considered to modify, and why?*

Summary of Response to Question 5

The number to text and the message inviting the passengers to text the LED display were intermittently shown on the bulletin. However the majority of the interviewees either reported that they did not know the number, or that they were unable to catch the text displaying it on the bulletin unless they stopped and dedicated time to reading it. This response suggests that the message needs to be displayed at a slower pace, since it may function as one of the crucial stimuli for triggering initial interactivity. This again highlights that an appropriate and evident trigger is influential in leading to subsequent interactivity.

Analytical Framework	Order of the Questions	Response of the interviewees (FZ number, (sequence of being interviewed))
Transfer	Q4:	- The interviewees started to test the installation; some even tried sending messages during the interviews (Overall).
Play	Q4:	- […] it offers a channel that allows people to vent and to say something they want (FZ06).
Accessibility	Q4:	- […] the meaning of it should be determined by each individual who sent messages to it (FZ07).
Challenge	Q4:	

Figure 6-11: Correlation of the four initial engaging characteristics and the responses of the passengers

6.4 Summary

Lindqvist (1995 p.205) remarked, “Developing the play has meant finding a theme, a content”. ‘Playfulness’ was the most evident characteristic that emerged in the study with *The Legend of the Phoenix* (the first case study). The participants sought the source of the sound and attempted to figure out how it was being generated. Although their physical movements were implicit, the engagement was already established. The combination of the shape, sound effects and display location of the art installation not only appealed to participants but also, to some extent, sustained their curiosity. Though none of the interviewees reported that they were seeing the artwork for the first time, the artwork sustained their attention while they were on the staircase or escalator. This highlights the characteristic of ‘**Accessible Challenge**’. Several interviewees were able to associate the art presentation with a broader context, while a number of them even identified the art installation as akin to the form of a phoenix. These results highlight ‘**Mind-Orientedness**’. However, the participants’ thoughts on this subject developed largely based on the streamlined shape of the art installation rather than through physical interaction. Although the movements of the passengers triggered the installation’s responsive mechanism (sound effects), the majority of the participants were unaware their movements were the instigator of these effects. Thus, ‘**Dominance Transfer**’ did not fully manifest. In conclusion, the artistic intent and interactive nature of the artwork were only partially exhibited.

The four engaging characteristics above were subsequently applied to supplementary studies conducted with *Event Horizon* and *Wonderscope* (see Appendix ii, pp.30-38). This allowed examination of participant activity and facilitated comparisons of activity within different public settings. The studies with the two experimental artworks were by no means intended to form a comprehensive understanding of the participants’ interactive behavioural patterns in a professional exhibition space. However, the features of interactivity distinguished in these phases of the research support the usability of the Analytical Framework, as they were devised

for examination of interactivity in public spaces similar to the MRT (see Glossary, p.xv). Furthermore the nature of the participant in the exhibition spaces, in particular their ways of engaging with interactive artworks, was revealed. Unlike the participants attracted by the unanticipated responsive multimedia effects in the MRT stations and the University, the participants in the two exhibitions often began an appreciation process with distant, visual admiration rather than direct physical involvement. This, to some degree, mitigates the potential for an unexpected impact on the audience, and restricts their curiosity. The features of '**Playfulness**' and '**Dominance Transfer**' were relatively reserved, as the participants tended to confirm rather than to explore the interactive mechanism. Nevertheless, this did not seem to affect their apprehension of the messages embedded in the artworks, because the majority of the participants made efforts to find the artwork introductions. This scenario was not seen in the previous case study and pilot studies (see Appendix ii, pp.13-29). Additionally, this pervasive phenomenon seems to entail less '**Mind-Orientedness**' in such professional exhibition spaces in contrast with non-art public spaces. The only functional characteristic of the study at this stage was '**Accessible Challenge'**, as it revealed the factors that limited the participants' engagement.

Through these examinations of interactivity, the four engaging characteristics were becoming more obvious. In order to improve consistency and clarity of the language used in my terminology, the four characteristics were altered to '**Transfer**', '**Accessibility**', '**Play**' and '**Challenge**'. They were initially unable to be utilised in examination of the artwork (*Poetry on the Move*), as the interplay quality of this interactive bulletin was not exhibited. The four engaging characteristics only fully manifested after I notified the participants that the LED bulletin was an interactive installation (Q4). The result suggests that an adequate stimulus plays an overarching role in driving a series of interactions. This unearthed a final, instrumental characteristic: '**Incentive**'. Once the interactive nature of the instillation had been revealed and

was explored by the participants, the messages appeared and were discerned by the sender within a moment. This lifted both '**Transfer**' and '**Play**'. The participants were keen to test the interactive mechanism as well as to see their messages shown on the bulletin. Although '**Play**' was physically implicit, it was latent within the interactivity and displayed on the LED bulletin. The participants seemed joyful and curious during the process of interaction. This prompted the participants and those with them to further engage with the artwork or, even more broadly, to communicate with other message contributors. This highlights both '**Challenge**' and '**Accessibility**', as the participants' attention was clearly intensified, while the narratives of the artwork were completely embodied.

Chapter Seven－Mapping Insights: Members of the MRT artwork selection committee, advisors and artists

7.1 Introduction

The interviews with three professional groups at this stage of the research process had a twofold purpose. Firstly they were to gauge the interviewees' perspectives regarding presentations of art in MRT spaces. Secondly, they were to further investigation of the three debatable terms: interactive art, meaningful experience and play, initially drawn from literature reviews (see Chapter 4) and pilot studies (see Appendix ii, pp.13-18). The first group consisted of six interviewees from the MRT artwork selection committee. These interviews concerned the interviewees' perspectives on both exhibition and passengers' encounters with artworks in MRT stations. The interviews with the second group were primarily concerned with the three advisors' perceptions and interpretations of the three contestable terms, particularly with reference to computer-based interactive art, whilst touching on the issues discussed with the first group. The artists who produced the three artworks studied were the third group. The interviews with this final group were mainly concerned with the artists' preconceptions of how their works performed as interactive pieces, while also posing the questions raised in discussion with the advisors. The second and third interview groups were given the same interview questions, allowing comparison between their opinions which derived from different cultural background. The findings from the three professional interview groups were intended neither to prescribe a formula for creating flawless artworks to present in the MRT or other similar public spaces, nor to comprehend exactly how interactivity, play and meaningful experiences are defined in a general sense. However, the findings from these interviews proved beneficial in gaining a deeper understanding of these separate areas. The illumination of these areas helped this study to make an informed argument for enhancing interactive experiences.

7.2 Methodology

Instead of using these interviews to research broad-based views amongst a large number of people, this study intended to seek a range of informative opinions and insights. Therefore it was deemed best to explore the views of a range of individuals with separate areas of expertise in-depth, through carefully choosing interviewees. Focusing on dialogues with small numbers of professionals to reveal phenomenon from specific research contexts, is widely recognised in qualitative approaches. This approach is taken in studies of the literature of culture, art, design, economics, politics, and technology (Sarantakos1994, Aberbach and Rockman 2002, Csikszentmihalyi and Robinson 1990, Flick 2007, Dexter 2006 et al).

The interviewees were selected in accordance with Marshall and Rossman's definition of elites. "Elite individuals are considered to be influential, prominent and/or well informed in an organization or community, they are selected for interviews on the basis of their expertise in their areas relevant to the research" (Marshall and Rossman 2010 p.155). The responses to the interview questions are analysed and summarised along with each interview question in order to illustrate which engaging characteristics (see Glossary, pp.xiv-xv) are relevant to the interview findings. Additionally the content of the interviews are succinctly quoted and presented in the three matrixes at the end of each dialogue section. The profiles of the interviewees, as well as more comprehensive interview transcriptions are provided in Appendices iii and iv.

The first and third interview groups (the members of the MRT artwork selection committee and the artists) are Taiwanese, thus all quotes from these interviews are translated from Chinese. The interview questions were sent to the interviewees before meeting them. Separate face to face interviews were conducted with a digital voice recorder. Consent for using the voice recorder during the interviews was gained prior to the interviews.

7.3 Dialogue with the Members of the MRT Artwork Selection Committee: Insights into artwork in MRT spaces

The interviews with the members of the MRT artwork selection committee were conducted between 26 February and 12 March 2009. Each interview lasted between 30 and 70 minutes with an average time of 50 minutes.

The first interview group consisted of two university professors of Fine Art, two architects, both of whom have university teaching experience, and one art curator. Each of these professionals had been invited to assess MRT artworks several times. In addition, an engineer from the Taipei MRT Corporation who was in charge of communication and coordination between departments over the design assignments of MRT stations, was interviewed. The instrument employed in interviewing the engineer was different from the one applied in the interviews with the five professional interviewees; the former interview differed as it included a number of questions on the chronological profiling of the MRT's art development. Based on the previous field studies, I found that generally passengers' attitudes toward artworks in the MRT stations are less enthusiastic than those of audiences in professional art exhibition settings. For instance, in general, passengers do not spontaneously seek artwork introductions and rarely stop to look at artworks. In order to further examine this phenomenon, along with the objectives mentioned above, this study identified three areas for exploration and further developed them into five interview questions as follows:

1) The influences of displaying artworks, in particular the interactive art, within the MRT space and the discrepancies between professional art exhibition spaces
2) The extent to which attributes of audiences (the passengers) in the MRT station and the space itself affect displays of art
3) Potentiality and development of computer-based interactive artworks in the MRT space

Interview – Question 1

The first question the interviewees were asked was: *In addition to the different types of audience, what are the possible major discrepancies between displaying artworks in professional art exhibition spaces and in the MRT stations?*

The interviewees talked about artworks as a necessary entity for the MRT station, their functions in the space and the necessity of using approachable forms capable of unpretentiously attracting passengers' attention. Although the question did not directly enquire about the audience's response, the interviewees all initiated discussions on the activities of the passengers in the MRT spaces.

Figure 7-1: *Small Park* in NTU Hospital MRT station

Figure 7-2: *Lotus in Heartful Hands* in NTU Hospital MRT station

Figure 7-3: *Lotus-Holding Hand* in NTU Hospital MRT station

Summary of Response to Question 1

The dialogues addressed **Incentive**, **Accessibility** and **Challenge** together with two generic qualities: practicality and functionality. Both Chen (Z.H) and Chen (M.X) indicated the importance of functionality and practicality of MRT art and mentioned the same example (see Figures 7-1-7-3). Nevertheless, they had divergent views upon these two qualities. Chen (Z.H) expressed the belief that the artworks have to be installed in major passenger thoroughfares in order to attract their attention. Although Chen (M.X) possesses a similar notion, she expressed a feeling that the space should be released and thinks that it would be better to install artworks on walls or convert existing facilities into art. Despite these divergent opinions, their views reiterate the nature of the MRT space: in such a public space adequate and potent **Incentives** are vital to lead the passengers into art contexts. Chen (Z.H) stated that in the MRT space, the presentation of art has to allow for the primary function of the space and create opportunities for natural and spontaneous aesthetic encounters. This to some extent echoes Chen (M.X)'s key concern, that while the installations are artworks, they also have their practical uses within the MRT space. These ideas underline the concept of **Accessibility** and **Incentive**, Hu and Huang also expressed similar viewpoints. In addition, Hu emphasised that artworks displayed outwith professional art exhibition contexts have to be able to "sustain, support, encourage and promote engagement", which concurrently reflects the characteristics of **Incentive**, **Accessibility** and **Challenge**.

Interview – Question 2

After obtaining views on potential conditions that may affect the presentation of art in the MRT environment, the second and third questions focused on the passengers' sensory experiences and engagement with artworks in the MRT space. The interviewees were asked: *To what extent is passengers experience and acceptance of the artwork taken into consideration during the artwork selection process?*

Without exception, the interviewees based their answers on the perspectives of relevant communities. They deemed it crucial that the artwork presented in MRT contexts be able to reflect local features and that passengers are able to interact with them in a natural manner. This concept was recurrently discussed during the interviews, although the interviewees addressed it through varied language, referring to geographical and local features, regions, live experiences, social groups and so forth.

Summary of Response to Question 2

Three issues constantly emerged from the dialogues in this session 1) natural interaction and engagement 2) identity and 3) community. These are essential elements in the characteristics **Incentive** and **Accessibility**. The interviewees reiterated that the attributes of the MRT spaces and its passengers (the audience) are fundamentally different from those in art galleries and museums. Neither the audience nor the space prioritise art. Thus, the works in these spaces are not dependent on the passengers' habituated attention to artworks in this context, and do not merely made to provoke their sensory responses. They are intended to evoke natural and intuitive interactions with the passengers, while bridging the artworks with the passengers' communities. Interestingly, although Ji argued that the passengers' opinions are not much of a concern, Yin noted that the passengers' feelings are very important. Yin stressed that some topics are taboo in MRT art, such as: religion, politics, sex, and violence (see p.53). Furthermore, both Chen (Z.H) and Hu note that acceptability of the artwork is significant: "novelty, stimulation and fun are good" (Chen (Z.H)). In other words '**Play**' can be crucial to initiate an enjoyable experience. However, they emphasised that only having a dazzling stimulus is insufficient and that this must not be achieved to the detriment of the artistic value and meaning of the work.

Interview – Question 3

The following question attempted to elicit potential factors in facilitating perceptions of the artwork and reception of artistic intent in the MRT space. The interviewees were asked: *What are the possible elements or interfaces used in effectively conveying artistic intent to the passengers in the MRT space?*

Although only Chen (Z.H) actively argued "materials and media are not the prime concern", none of the other interviewees suggested or specified any media or material which could bring about far-reaching sensory influences or effectively convey artistic intent to the passengers. A consensus seemed to emerge, in which capturing the passengers' attention was the priority. In this regard, both Chen (Z.H) and Chen (M.X) again highlighted that the passengers' main purpose in coming to the MRT stations is not to admire artworks.

Summary of Response to Question 3

Incentive and **Accessibility** were once again the central theme in this session. The interviewees were primarily concerned with there being a sufficient stimulus, as this prompts the passengers to engage with artworks at the outset. Approachable presentations and elements that could trigger a dialogue or even a reminiscence of specific social contexts between the passengers and artworks were equally valued. Chen (Z.H) suggested that an appropriate location is one of the determents in effectively conveying artistic intent to the passengers. Meanwhile Chen (M.X) indicated that affable expressions can be beneficial in inducing a pleasant initial interaction, this interaction could draw further resonance and might sustain admiration of an artwork. Her views reflect features of both **Play** and **Challenge** and illustrate their importance to exhibiting artworks in the MRT space. Huang too stated that it is essential to make the passengers aware of the artwork and that encouraging participation and dialogue is significant. He indicated that participation may begin by educating the participants. Though this may take a longer time, it would be worthwhile as in the long term it would facilitate artistic engagement.

Interview – Question 4

The fourth question was aimed at uncovering inappropriate elements of display or design of artworks that may incur detrimental effects. The objective of this session was to examine whether those potentially inimical factors would deter the passengers from interacting with the artworks. It was anticipated that the interviewees would speak about unfavourable experiences in assessing MRT artworks, particularly the computer-based pieces, which led them to rule out art pieces from the selection list. The interviewees were asked: *Based on your experience in the selection and examination of the MRT artworks, what are the major concerns that often lead to the elimination of artworks?*

However, none of the interviewees indicated specific issues which may lead to the elimination of computer-based art installations. Instead, their comments emphasised the security of art installations against passenger inflicted damage, levels of maintenance required, concerns over the length of time for which the artworks are able to be displayed, and the possibility that similar artworks are already exhibited in other MRT stations. However, there was no clear consensus regarding maintenance. Though it was initially considered to be a potentially instrumental determinant, both Ji and Huang did not mention it, while Hu indicated that it was not an issue worth being discussed as it depends on the mindset of the people who are in charge of maintaining such artworks.

Summary of Response to Question 4

Maintenance and security are considered some of the fundamental points for examination when selecting MRT artworks. Maintenance is essential in sustaining functional artworks (especially computer and electronic based artworks), moreover it directly affects the characteristic of **Transfer**. Given the theme of the discussion, the feature of **Accessibility** repeatedly emerged within the dialogues. Chen (Z.H) stated that if an artwork could be placed anywhere, it would be a mundane piece which he would not choose. This correlates with Chen (M.X) and Huang's

responses and indirectly reflects Hu's view, in which she remarked that if an artwork is incapable of indicating the narratives of the specific group of people or locality she would not choose it.

The length of time identified for an MRT art work warranty differed according to each interviewee. Nevertheless, it was confirmed by Yin that currently in the Taipei MRT the warranty for computer-based interactive artwork is three years, whereas for art pieces with limited or no electronic pieces it is one year. Yin mentioned that security and maintenance are the prime concerns of the Taipei MRT Company. However, the company has no authority to interfere with artwork selections, which is completely determined by the MRT artwork selection committee.

Currently, responsibility for maintaining an artwork rests with each MRT station. If the passengers report faults with the artwork, the station will send a technician to deal with the issue. Yin also suggested that there should be a professional technician in charge of maintaining electronic and computer-based artworks, as the number of such artwork has increased over the last decade.

Interview – Question 5

Along with the previous dialogues, the final question addressed whether the glitch and maintenance issues of computer-based art installations would affect assessments and decisions when selecting artworks. The question also explored the interviewees' opinions on the future development of such art installations in an MRT context. The interviewees were asked: *Currently, there are a number of electronic and computer-based interactive artworks exhibited in Taipei MRT, however some have fallen into a state of malfunction. Can you discuss the possibility and further development of this kind of art installation in the MRT context?*

Despite there being no affirmative indication that technical and maintenance issues would affect the artwork selection committee's decisions when choosing artworks, the issue of whether an artwork is capable of being exhibited long term was again raised by Chen (Z.H), Ji and Chen (M.X). This has been deemed a fundamental condition, as it was continuously raised.

Summary of Response to Question 5

Given the nature of the MRT space, the artworks selected are meant to be exhibited long term. Robustness is one of the basic criteria in the assessment of any type of artwork. This criterion is also an essential component in ensuring that **Transfer** can be realised.

Chen (Z.H) explained that although computer-based interactive artwork has a potential advantage in attracting the passengers' attention, it is important that the artwork is displayed in an optimum condition. This allows delivery of artistic intent and triggers interactions with the passengers. Chen (Z.H.)'s observation highlights a co-dependency between '**Incentive**', '**Transfer**' and '**Accessibility**'. Chen (Z.H) furthered the discussion by stating that people may get bored with invariable responsive effects and indicated that this issue also exists in conventional art forms. He suggested that the sense of 'boredom' could be reduced by more sophisticated and dynamic art presentations. This highlights the concept of **Challenge**. He linked this to 'community', again showing the symbiosis of **Challenge** and **Accessibility**.

Huang echoed the centrality of community, though he used the word 'locality'. He also indicated that, in comparison with other types of art, computer-based artworks have received a relatively high degree of attention, as they already outnumber other types of artworks in the MRT. Currently, approximately one in six artworks exhibited in the MRT stations are electronic or computer-based art installations. Ji noted that issues with maintenance are based on how the art work is administrated; his comments echo Hu's opinion. Hu stated that her judgments on this

type of artwork will not be influenced by previous unsuccessful applications in the same media. Instead she foresees that this type of artwork will become common, because the younger generations are familiar with the ‘language’ and its presentation.

Analytical Framework	Order of the Questions	Responses of the interviewees (Name of the Interviewees)
Incentive	Q1:	- […] force the passengers to engage with them […] (Chen (Z.H)) - It can be art, whilst, at same time, it can be used (Chen (M.X)). - Provoking sensory responses of the general public to the artworks (Hu).
	Q2:	- Novelty, sensory stimulation and fun are good (Chen (Z.H)). - […] artwork has potential to deliver natural interactions with people (Ji). - A simple, appropriate sensory reminder would be enough (Chen (M.X)).
	Q3:	- Relatively strong and swift touching elements […] are required (Chen (Z.H)). - […] it has to be able to tickle your consciousness (Ji). - Just let them see the artwork; that is the most important thing (Chen (M.X)). - […] let the passengers know about the existence of the artwork […] (Huang)
	Q5:	- […] sensory stimulation and sustainability […] very important (Chen (Z.H)).
Transfer	Q5:	- If the art piece […] does not work the way it should, it cannot deliver its meaning (Chen (Z.H)).
Accessibility	Q1:	- Are these works approachable and can they be accepted by the audience [passengers] in the space? (Chen (Z.H)) - There are three principals for the MRT art: […] 2) locality and 3) uniqueness (Huang).
	Q2:	- It would be better […] to bring about this concept [community] and maybe engender resonance (Chen (Z.H)). - […] have to be capable of integrating their artistic creation with living experience (Ji) - I would lay emphasis on 'regions' […] (Chen (M.X)) - I am very concerned about local humanity and physiography (Hu). - […] artwork could trigger a sense of attachment to specific places (Huang).
	Q3:	- Connecting with the passengers swiftly […] a sense of belonging […] (Chen (Z.H)) - The artwork has to have some relationship with their social contexts (Ji). - […] having humour that can be accepted and that everyone can remember, […] trigger resonance (Chen (M.X)). - Establishing connections between the passengers and their own living experiences […] (Hu) - […] and help them to read artworks, then the participants may do the rest themselves [to understand art piece] (Huang).
	Q4:	- I will then look at the other parts which I have mentioned such as specialty, uniqueness, sense of belonging (Chen (Z.H)). - […] reflect local and cultural features were usually good artworks (Chen (M.X)). - I believe that artworks always happen to have some sort of relationship with living experience of specific group of people (Hu). - We hope each station has its own features, a unique presentation (Huang).
	Q5:	- The important thing is that we have to turn back to that essential concept of 'community' […] (Chen (Z.H)) - The point is that you have to consider the three conditions 1) uniqueness 2) locality 3) artistry (Huang).
Play	Q3:	- I feel maybe a sense of humour; do not to be too recondite […] (Chen (M.X))
Challenge	Q1:	- As [it has] to be able to sustain, support, encourage or promote engagement (Hu).
	Q3:	- Furthermore, it can create a long lasting admiration (Chen (M.X)).
	Q5:	- […] this may be improved if there were more sophisticated or dynamic interactive presentation (Chen (Z.H)).

Figure 7-4: Correlation of the engaging characteristics and the responses of the MRT artwork selection committee

7.4 Dialogue with the Advisors: Interactivity and Meaningfulness

The interviews with the UK based advisors were carried out between 7 July and 16 September 2009. Each interview lasted between 40 and 70 minutes with an average time of 50 minutes.

The second group was comprised of three art advisors; all possessing extensive experience either in creative practises or who had taught computer-based art for several years. The objective of this section was primarily to explore the insights of the experts focusing on two separate notions: interactivity, and meaningfulness, while providing an opportunity to expose unexpected insights relevant to issues such as play and the presentation of interactive art in open public spaces. In Chapter 4 the outcomes of the literature reviews show how challenging it is to form definitions for these notions. Graham (1997) and Huhtamo (1995) suggested it would be more constructive to look at forms of interactivity. Dewey (2005) indicates that the whole principle is abstract, and it only turns palpable in its applications. Again, the purpose of conducting interviews with the three advisors was by no means to form universal definitions, but to consult their professional opinions and experience in these areas so as to inform the Analytical Framework.

The first two questions concerned the advisors' perceptions and their definitions of interactivity and meaningfulness. The latter three questions were intended to reveal their thoughts on discrepancies between interactive and static art forms, as well as issues over presenting interactive installations in public spaces, in particular, transport hubs. In order to elicit informative resources for this specific research context, prior to starting the interviews, the advisors were given the working definition of interactive art (see Glossary, p.xii) in this research.

Interview – Question 1

The first question raised the notion of ideal interaction. This was intended to obtain the advisors' views on meaningful experiences in terms of interaction with artworks. They were asked: *Can you elaborate on what you perceive to be an ideal artistic interaction?*

The advisors indicated that the ideal aesthetic interaction may not exist; however, their responses associate the notion with other concepts; meaning and meaningful. Johnson highlighted three notions that may constitute the ideal interactive experience. The first of which is concerned with meaning. Gillman also linked the concept to another term 'transaction,' which suggests that meaningful experiences only exist in forward transactions. Although, Graham did not mention either meaning or meaningfulness, she indicated that an artwork behaves as a host to interaction between people and allows them to develop fulfilling experiences.

Summary of Response to Question 1

In this research context, there are no concise synonyms into which an ideal artistic or meaningful interaction can be rendered. It may appear during a process of interaction in a combination or series of deliberately organised events. Both the feedback and reflection in this process should be sufficiently potent and well orchestrated so as to lift resonances and consciousness. The dialogues concurrently highlighted characteristics of **Transfer** and **Accessibility**. The interviewees see that meaningful experiences normally remain a dormant state until the audience engages with the artworks. Thereby, meaningfulness is not an affirmative indicator. Instead it is individual, dwelling in the perceptions and cognitions of specific groups that may be evoked through interactions between people or between people and artworks.

Interview – Question 2

In Chapter 4, the literature review concerning the definition of interactive art shows the divergence of opinion in the field. The objective of the second question was to continue to unravel this issue by trying to understand the advisors' views. The advisors were asked: *Based on both your academic and practical experience, can you define the word 'interactive' in relation to the art form that we have been discussing?*

The advisors unanimously asserted that the definition of interactive art is vaguely defined and has been used loosely, with no clear consensus emerging on a definition of this art from. Johnson noted that he attempts not to use the terms 'interactive' or 'interactivity'; however, he has not yet found a suitable alternative term to describe the practise he deals with. Gillman pointed out that people often use the term 'interactivity' with a personal understanding based on their contexts and interpretations. However, he contends that within those diverse voices one can observe part of the artistic qualities of this concept. Although Graham's defined the art form under discussion as reactive rather than interactive, which seems viable, she accepted that this is not a commonly used term.

Summary of Response to Question 2

Although no assertive definition of 'interactive art' was stated, the findings highlighted the features of interactive art that significantly inform interpretations, differentiation and employment of the term. Johnson pointed out three critical elements 1) mental process 2) physical process and 3) experience, which constitute what he regards as the true meaning of interaction. These can be combined with **Transfer** and **Accessibility** as the three elements traverse physical and cognitive realms. This notion, to some extent, echoes Graham's argument that "I am not sort of saying that the reaction of that computer isn't valuable and cannot be complex, but I think it needs that extra level of interaction". She goes on to claim that it is

obviously different if one receives reactions from computers; it is a different form of engagement than the interaction being received from a visual appreciation of artworks such as paintings. Gillman stated “I think my first assumption, if someone came to me and said, ‘I work in the field of interactive art’; I would think they are using technology.” Together with the ideas raised by Johnson and Gillman in the previous question, this implies that the definition of interactive art hinges on the different contexts and uses. This art form cannot be solely defined by mechanical mechanisms; a more complex understanding involving participants’ reactions, responses, perceptions, and cognition is essential.

Interview – Question 3

The previous question elicited ideas related to distinguishing interactivity between computer-based artworks and other static art forms. The third question was used to further explore this perspective. It was anticipated that the outcomes generated by these questions would further the illumination of the various features of interactive art, a topic that has been discussed earlier in this research. The advisors were asked: *In your opinion how does the interaction between conventional arts and interactive arts differ?*

A direct discernable responsive feedback, which must be clear enough to trigger inputs from the participants, is a distinctive feature of interactive art. The advisors all identified this feature as one of the fundamental elements that make up this art form. Although Graham explained these concepts by using the term ‘reactive’, she was none the less discussing the same art form. Gillman explained his perspective on this art genre by discussing why he thinks his work *Metroscope* is not an interactive artwork, even though it interacts with millions of people on the internet autonomously.

Summary of Response to Question 3

While interactivity is accepted to also exist in other conventional and static art genres, that interactivity is primarily psychological. This is significantly different from the participants' perceptions of direct responsive multimedia effects, which prompt them to take action and triggers loops of interaction. Instead of explaining what constitutes interactive art, the interviewees pointed out what does not. Both Johnson and Graham mentioned that the fundamental differences between interactive and other conventional artworks lie in responsiveness and non-responsiveness. Gillman does not consider his artwork *Metroscope* to be an interactive piece because it does not directly interact with the audience. Although, people's online inputs are transferred and used as resources for presentation of the artwork, these people do not know they have indirectly interacted with the art installation. The discussion suggests that the feature of **Transfer** should be considered one of the determinate characteristics in defining interactive art. This **Transfer** is based on a direct involvement of the participants, achieved by presenting them with evident responsive messages and offering them the means to change the artwork's presentation.

Interview – Question 4

The discussion of the third question with the members of the MRT artwork selection committee concerned possible elements or interfaces that effectively convey artistic intent to passengers. The following question was devised to further investigate this issue with a specific focus on the interactive arts. The advisors were asked: *What do you consider to be the crucial elements of interactive arts that may inspire or lead audiences to obtain artistic intents or develop their fulfilling experiences?*

This discussion raised a number of frequently contested conditions: 1) whether the form of art presentation is able to communicate artistic intent appropriately 2) if the artwork is suitable to be presented in its context in terms of the robustness of the materials being used and 3) if the artwork

is capable of capturing people's attention with appropriate timing, in particular if the work is presented in a non-art public space. Although diverse views emerged from the responses, there was some correlation between these views and they are crucial components in leading the participants to obtain artistic intents and fulfilling experiences.

Summary of Response to Question 4

Johnson's three dilemmas of interactions: 1) appropriate medium 2) communicating ideas and 3) enhancing experiences, lays out a relatively extensive conceptual strategy to lead the audience to obtain artistic intent and meaningful interactive experiences. These three dilemmas reflect features of **Incentive**, **Transfer** and **Accessibility**. Indeed, there is no single element that is able to create conditions for meaningful interactions alone; hence, a combined strategy is necessary.

Although Holmes (Ascott 2000 p.94) claims that "interactive computer art works are more engaging than static works in that they offer the navigator some degree of manoeuvrability in their interfaces", Gillman pointed out that a lot of people are attracted by the 'magic' (responsive multimedia effects); they are often interested in the magical intent rather than artistic intents. This highlights the significance of a collaborative role of **Incentive** and **Transfer** in drawing people into art contexts. In addition, Graham noted that if the artwork is located in public spaces, it is important for it to capture people's attention with appropriate timing by adopting elements that they are familiar with. This view features both **Incentive** and **Accessibility** and offers a route to direct sensory encounters leading to cognitive engagement.

Graham further suggests that embedding subtitles in interaction allows participants to explore. This exploration may subsequently enhance their experience. Both Gillman and Graham stated that increasing the level of variation in the artwork may augment its engagement with the participants. The dialogue with them drew out the characteristics of **Challenge** and **Play** as measures to prompt an advanced engagement.

Interview – Question 5

Along with the themes illustrated in previous questions, this final discussion emphasised presentation of interactive art in public spaces, in particular MRT settings. The advisors were asked: *With regard to placing interactive media arts in the MRT and similar public spaces, what do you consider to be the crucial elements that might serve to enhance the experience or even provoke the thinking of the audience?*

The results were similar to those obtained from the interviews with the members of the MRT artwork selection committee. No specific materials were highlighted as essential to this goal during the interviews, while the capability of raising the people's attention within a short time scale and elements able to stimulate resonance were considered highly important.

Summary of Response to Question 5

The dialogues again highlight the nature of the space. Robustness (the premise of sustaining **Transfer** in a functional state) and the **Incentive** of artworks are considered essential in arousing subsequent interactivity or even enhancing interactive experiences. Johnson noted that since it is a transient space, it is important to engage the passengers in a very short timescale otherwise they will miss the experience. Graham also supported this view, stating that as the works are in a public space the message has to be very clear and suit specific public settings in order to engage different people. This is because the meanings of a specific space can assist people in navigating the art context. This underlines the characteristic **Accessibility**.

Analytical Framework	Order of the Questions	Responses of the interviewees (Name of the Interviewees)
Incentive	Q4:	- An easy start, an easy introduction, so, in that very instant, it is reacting with them. And of course, people don't expect things to react them, mostly. So, yes. It needs to be very clear at the start (Graham).
	Q5:	- If it's going to happen in a very short timescale, it has to be something which is going to grab their attention fairly immediately (Johnson). - […] you have to be absolutely clear about different levels of audience' experience and how to get them involved. […]they have got to have reasons for interacting […] (Graham)
Transfer	Q1:	- […] there are number of different levels, obviously, on which you can respond to that. The first one for me. […] meaning is not activated until somebody engages with it and receives that meaning. […]. With an interactive art piece, the meaning should never exist completely within the object or within the computer (Gillman).
	Q2:	- […] the physical processes […] (Johnson) - […] an object […] exists in a very active activation by an audience (Gillman). - Look at the painting and it's acting upon you. Actually, it's not true; […] (Graham)
	Q3:	- The artefact cannot respond back to the audience's response (Johnson). - *Metroscope* is not actually interactive because you can't interact with it, […] it's interacting with millions of people, but you can't directly interact with it (Gillman). - It's very different to have something react to you […] control is a big theme […] (Graham)
	Q4:	- […] does the interaction experience work and if it does, is it enhancing the overall intent in terms of communicating that idea? (Johnson). […] So technology has to work (Johnson). - It depends a lot on what somebody is bringing to that artwork; […] if people engage with something and they don't understand how the magic is done, they get quite upset and they don't just let themselves enjoy the magic (Gillman).
	Q5:	- […] it has to be something where they have to get an immediate response to understand what's going on (Jonson). - […] incredibly resilient, so they're very tough, very reliable (Gillman).
Accessibility	Q1:	- Does […] the participant or user understands the language that the artist used? (Johnson) […] How much emphasis is being placed on experiential or knowledge […] (Johnson)
	Q2:	- […] it is about that integration of the mental processes […] and the experience (Johnson)
	Q4:	- […] all those things combined working together to create a truly engaging interactive experience for the audience […] (Johnson) - […] what they're bringing to that experience (Gillman). - […] it needs to be sort of a quite common metaphor, (Graham)
Play	Q4:	- […] small subtleties so that people can become experts in use it, so that it gets more rewarding (Graham).
Challenge	Q4:	- […] the most interesting ones are those that are capable of strong infinite variations. (Gillman) - […] people get bored of that after a while so you need to do something a bit more interesting and creative (Graham).

Figure 7-5: Correlation of the five engaging characteristics and the responses of the advisors

7.5 Dialogue with the Artists: Preconceptions and views of presenting interactive art in the MRT space

The interviews with the three Taiwanese artists were carried out between 15 March and 1 April 2010. Each interview lasted between 30 and 90 minutes with an average time of 50 minutes.

The interviews with the three artists focused on their preconceptions of the interactions generated between the passengers and their artworks. These are the main objective in this phase of the research, since the results are a critical resource to for comparison with the participants' (passengers) experiences and the UK based advisors' views. Moreover, the status of the three artists and their extensive experience in art practise also fits with Marshall and Rossman's definition of elites (see p.149). Thus their views on the core research issues are also significant in informing the Analytical Framework.

Sheng-Chien Hsiao is referred to as 'Hsiao' in the research (the artist behind *The Legend of the Phoenix*). He has been invited to 'Location One' artists in residence program in the USA and has exhibited in the UK, Taiwan and China. E-Chen, (the artist behind *Poetry on the Move*), is an art architect. He has exhibited in such countries as the USA, Austria, and Singapore. Yang-Huei Chiang is referred to as 'Chiang' in the research (the artist behind *We are One Family*). He is the founder of VERY Conception Corp. Chiang and his team have conducted various public art projects in Taiwan. In order to trace the artists' thought processes in creating their works, and to offer an understanding of how the selected works emerged from the artists practises as a proposal for the MRT stations, the artists' artworks are briefly listed in Appendix (see Appendix iii, pp.44-49) (year / type of art forms / '*name of artwork or exhibition*' / exhibited location and or organisation).

Interview – Question 1

The first question put to the artists was a request to *speak about their artworks*, specifically the ones which are currently exhibiting in the MRT stations. The artists were told that their answers may include but should not be limited to: ideas regarding the art's creation and their expectations of the interaction between the artworks and participants.

A sufficient stimulus is a key element in the development of subsequent interactions. This was identified by E-Chen and Hsiao as one of the issues they encountered, leading them to partially withhold the artistic intent of their works as they indicated that there are insufficient stimuli in their artworks. E-Chen mentioned that he is aware that no audiences are using his interactive LED bulletin. However he attributes this issue to the imposition of message filtering systems by the MRT Corporation and to their being no suitable unit to administer the artwork. Hsiao also noted that his shadow display idea was sacrificed due to the limitations of the space. The results suggest that more comprehensive plans need to be conceived in advance when considering presenting interactive artwork in public spaces like the MRT.

Summary of Response to Question 1

E-Chen and Hsiao stated that due to a void of **Incentive** and **Transfer**, their works are not able to be presented in an optimum state. The issue reflects Csikszentmihalyi's argument (1990) that having the capability to engender feedback is instrumental, though it does not necessarily need to be an aesthetic experience. Without overarching incentive, no subsequent interactions can be generated, this is true irrespective of the contexts of the artworks. The responsive feedback from the art installation has to be evident and sufficient to attract people's attention in the first place, further prompting them to contribute their inputs.

The dialogues with the artists show that artworks dedicated to the MRT (or similar) spaces need to be carefully tailored. The creative process should not only consider the artwork itself or the indifference of the passengers in the space, but also the major function of the MRT station that may restrain art presentations. The purpose of the space is not primarily for exhibitions of art, thus an artwork is often compromised or lost within the space, especially if the presentation was not properly planned.

Chiang and his team seemed to have considered this aspect relatively thoroughly. The symbolism (scooter-handlebars) they used to create the artwork not only allowed the participants to start engaging with the artwork with ease (**Incentive**) but also raised their consciousness as this element is familiar to them (**Accessibility**). The scooter devices prompt an intuitive hands-on engagement (**Transfer**) and **Playful** interactions subsequently developed.

Interview – Question 2

Based on the principle of the 'structured interview', the following questions are identical to those I employed in previous interviews with the advisors. The first two questions concerned the artists' standpoints on interactivity and meaningfulness, while the following three questions focused on the differences between interactive art and static art forms, and on presenting interactive installations in public spaces, in particular transport hubs. The definition of 'interactive art' (see Glossary, p.xii) in this research was given to the artists prior to starting the discussions. The artists were asked: *Can you elaborate on what you perceive to be the ideal artistic interaction?*

The artists all began the discussions with their understanding of the word interactivity. Their statements show the degree of complexity in defining the term interactivity in their art practises as well as in terms of identifying the interactive art form. Despite the fact that I provided this

study's working definition of interactive art before commencing the dialogues, E-Chen did not give further comments; instead he simply remarked that the question will lead to a swirl of debate. Hsiao expressed a similar view, nevertheless he and Chiang gave a more in-depth dissection of the issue, in which they both deemed interactivity as a 'material' for creating artwork where using technology is not the goal but an approach. This concept is akin to using other materials and techniques in artistic creations.

Summary of Response to Question 2

'Interactivity' is considered a medium by the artists. Being a medium, it consists of two essential components; **Incentive** and **Transfer**. Using the reactive and manipulative nature of this medium would never be the ultimate goal in their artistic practise, but an approach that they have adopted in their creative work. One of the objectives was to embody the beauty of this art form; a process based artistic interaction, leading the participants to develop their experience through intrinsic reward or by obtaining the artistic intents. When combined with **Accessibility**, the beauty or essence of this art form can be fully realised. According to the artists' views, the artistic interaction within this interactive process should make pertinent use of the medium of interactivity, the participants' physical involvement and connection with the context, as well as communication between participants and the work and between different participants.

Interview – Question 3

The issue of defining interactive art was investigated in the literature review chapter (Chapter 4) and was also raised during the interviews with the advisors. In order to obtain more representative and perhaps diverse views, the same question was posed to the artists. They were asked: *Based on your extensive experiences in artistic practise, can you define the word 'interactive' in relation to the art form that we have been discussing?*

The artists based their answers on their own experiences, with numerous recurrent observations 1) the participant is an instrumental component in the completion of art 2) it is important that the participant is able to change presentations of art and 3) the participant's mental state or recognition of artworks must vary over the process of interaction. Hsiao, pointed out two essential layers in the formulation of interactive art: Interface and Transformation. E-Chen notes that his artwork is realised by the participants, a practical principle that is often identified with interactive artworks.

Summary of Response to Question 3

The dialogues drew out a number of elements often identified as essential to interactive art, for example, sensory perceptions (**Incentive**), physical involvement (**Transfer**), and mental alteration (**Accessibility**). However, the dialogues were inevitably still complex, even though the artists had already been provided with the working definition beforehand. The results reiterated that instead of looking into the definitions of interactive art, it would be more worthwhile to examine the conditions under which meaningful experiences can be generated.

Interview – Question 4

The fourth question was aimed at further exploring the artists' views of discrepancies in interactivity between conventional (static or traditional) art and interactive art. The artists were asked: *In your opinion, how does the interaction between conventional art and interactive art differ?*

The artwork is not complete without the participants; this is the essential condition that differentiates interactive art and static art forms. The artists were agreed on this perspective. Hsiao states that this feature also echoes E-Chen's view on the embodiment of the artwork, which relies on the participants rather than artists themselves. Hsiao further emphasised the

discrepancy between interactions that develop association by purely visual appreciation of artworks, and those based on physical involvement within the interactive process. He went on to state that interaction in this art form does not solely rest upon mental association but also physical participation, also asserting that the ability to generate various responses is equally important. Chiang deems this process a course of intervention, which is crucial in revealing the artistic intent and significantly different from most conventional art forms as they often display outcomes rather than processes.

Summary of Response to Question 4

The artists pointed out that the capability to provoke associations (**Accessibility**) runs in tandem with physical involvement (**Transfer**) within the interactive art form. Chiang indicated that conventional art genres are in most cases defined by 'materiality' and presented as end products. The meanings within interactive art or the participants' cognition are derived through the course of interaction rather than being solely obtained via visual appreciation and reading of artworks. Conventional static art forms display a complete result, whereas interactive art emphasises the process of interaction with their participants. The completion of the interactive artwork is by no means denoted by artists, instead relying on input from the participants.

Interview – Question 5

Both the fifth and the final question concerned the artists' opinions on potential key elements in leading the participants to obtain meaningful experiences. The former question discusses overall exhibition conditions while the latter question specifically focuses on MRT like public contexts. The artists were asked: *What do you consider to be the crucial elements of interactive art that may inspire or lead participants to obtain artistic intents or develop their fulfilling experiences?*

The outcomes that emerged in this section to some extent resonate with those raised in previous interviews with the three advisors. Again, no specific media or materials were mentioned, while the capability to immediately capture people's attention was considered essential. The artists initiated discussions from the participants' experiences. Hsiao indicated those elements have to be able to evoke participants' empathy, nostalgia, and sentiments relating to specific social contexts or their sense of morality and so forth. These elements were also reflected in the dialogue with Chiang. In addition, Chiang pointed out that 'unfamiliar factors are also capable of having a significant impact', such as the movie 'Avatar' (December 2009) which was initially foreign to audiences in innovating 3D imagery, but still aroused tremendous resonances.

Summary of Response to Question 5

In addition to the immediately discernable effects (**Incentive)** and the elements indicated above that are close to participants' experiences (**Accessibility**), Chiang noted that the interactions between the participants and the artwork sometimes bring unanticipated results. He highlighted that these may be far from the original artistic intent. Graham cites Lozano Hemmer's argument in favour of this concept (Dezeuze 2010 p.288) in the *'do-it-yourself' artwork, Participation from Fluxus to New Media*, "successful pieces that feature interactivity for groups are usually out-of-control". However, Chiang offers a divergent view, considering a successful interactive artwork to be one that does not have a completely unexpected outcome. The information has to be clear enough to lead the participants to obtain sufficient artistic intent via the process of their interactions. His view, to some extent, echoes Johnson's notion that the three interactive dilemmas: appropriate medium, communicating ideas and enhancing experiences, have to work together although artworks may not deliver their means one hundred percent of the time.

Interview – Question 6

In the final question the artists were asked: *With regard to placing interactive media arts in the MRT and similar public spaces, what do you consider to be the crucial elements that might serve to enhance the experience or even provoke the audience to think?*

The nature of the MRT space and the people in the stations are the major concern for the artists in enhancing the participants' interactive experiences. Both Hsiao and Chiang drew comparisons of the MRT station with professional art exhibition spaces, in which they noted that in general people will not purposefully make an effort to visit the MRT station to appreciate artworks. E-Chen proposed the use of a mobile phone as a gateway for interaction, not because of his art installation (*Poetry on the Move*), but because nearly everyone has mobile phones and they carry them around every day. E-Chen considers this pervasive tool to be an ideal agent of interaction.

Summary of Response to Question 6

It is not natural for people to actively seek an artwork's meaning in the MRT-like spaces. Therefore in such environments sufficient and immediate **Incentives** will be crucial when considering the engagement of the general public in subsequent interactivities and acts of contemplation. E-Chen's claim that visualisation can be an essential element while Hsiao's indication that an artwork introduction panel is important (**Accessibility**). No other specific sensory elements or specific approaches were suggested as functional elements that are able to provoke the participants into thinking and enhance their interactive experience. Nevertheless, the ability to hold the passengers attention is considered the priority by the artists, which again highlights the characteristic of **Incentive**. By securing the attention of the passengers with appropriate timing and formation, the chances of deeper engagement are augmented, and through this augmentation the participants' interactive experience could be enhanced.

Analytical Framework	Order of the Questions	Responses of the interviewees (Name of the Interviewees)
Incentive	Q1:	- I am aware that no one uses it. [lack of Incentive] (E-Chen) - […] scooter handlebars (Chiang)
	Q2:	- 'Interactivity' is not simply about splendid multimedia effects [Nevertheless it can be an essential interactive element]. (Chiang)
	Q3:	- The first is interface, which is the first layer of contact with the audience (Hsiao).
	Q5:	- The fact that the audiences can immediately catch the responses produced by artworks is very important (E-Chen).
	Q6:	- Immediacy (E-Chen) - The passengers in the station rush to work or school and they hardly pay attention to the piece (Hsiao). - holding the audiences attention or to make them slow down (Chiang)
Transfer	Q1:	- [the passengers were unaware of] how the sound is triggered [this indicates a lack of 'Transfer'] (Hsiao)
	Q2:	- 'Interactivity' is a material […] The artist's job is to think about how to use materials to bring out their features (Hsiao).
	Q3:	- The artwork is not made by me but by the audience. […] (E-Chen) - The audience has to be able to alter the status of the artwork. […] if the only function of interactive effects is to attract the audiences' attention but nothing else, and the effects do not change or reveal the meaning of the artwork, those interactivities may be considered as unnecessary effects (Hsiao).
	Q4:	- The course of interaction between the two parts is deliberately conceived during creations of art (E-Chen). - It must include participation from the audiences otherwise the work is considered incomplete. […] (Hsiao) - The 'interactivity' is to generate or to provoke actions or responses within the course of interaction between audiences and artworks […] (Chiang)
	Q5:	- 'interactive art' means the art is not to be instructed but to be engendered (Chiang)
Accessibility	Q1:	- Riding a scooter is an image that people are familiar with in Taiwan (Chiang).
	Q2:	- We know the symbolic system is key in the creation of art; likewise the impact of minds and the process of interpretation are also important (Chiang).
	Q3:	- The second layer is the transformation, which has to be able to alter the audience's psychological state, […] (Hsiao)
	Q4:	- If [...] without the interaction and participation of the audience, the meaning of the artwork cannot be completed [This is co-influenced with the Transfer] (Hsiao).
	Q5:	- Artworks have to be able to provoke something like the audiences' sense of morality or experiences which they are familiar with (Hsiao). - […] not too far from people's experiences. Such as things which people are familiar with or […], things that are completely unfamiliar to them […] (Chiang)
	Q6:	- We have to find a common ground (Chiang).
Play	Q1:	- The audience operating the devices and entering their images to the family device is a symbolic process 'riding towards a happy boulevard' (Chiang).
Challenge	N/A	N/A

Figure 7-6: Correlation of the five engaging characteristics and the responses of the artists

7.6 Summary

The primary objective of the interviews with the three expert groups was to uncover instrumental elements that have the potential to constitute meaningful interactivity and experiences. This was to allow this study to make informed judgments for the Analytical Framework. Additionally, since this is highly context dependent research, references regarding presenting computer-based interactive art in public spaces, such as the MRT proved invaluable. In order to dissect the contents of the interviews this study has summarised the findings into three parts: 1) Insights in defining interactive art 2) Insights on the correlations between the Analytical Framework and meaningful experiences and 3) Insights into the presentation of interactive art in MRT like spaces.

Insights in Defining Interactive Art

No single professional interviewee gave a definitive answer to the questions on the definition of interactive art. Instead, the complexity of attempting to substantiate a definition of interactive art was repeatedly highlighted. Nonetheless, the interviewee's insights into what may or may not constitute (computer-based) interactive art assisted further informative arguments and articulated the features of the art form. Undoubtedly, in this research context interactive art is defined neither solely by mechanical responses and reactions, nor by mental association, but by an integration of both. Chiang defined interactivity as a type of media for his artistic creations. Unlike general static artworks, interactive art is not classified by materiality but the process of actions and responses between the participants and artworks. This conception resonates with the term "response is the medium", coined by Myron Krueger (Cited in Fry 2007 p.255). Krueger's creative practise was focused on responses occurring between participants and artworks, the arguments imply that the active participant is an indispensable element. This concept also reflects the discussion with Gillman (Q2) in which he stated that the significance of this art form exists in a very active activation by the participants. Thus, active participation is a crucial

element since without it the artwork cannot be realised. In Q4, E-Chen and Hsiao claimed that the completion of their artworks was, by no means, solely accomplished by themselves, but through active contributions from the participants. Nonetheless, this active element neither manages to fulfil nor to mitigate the debate regarding the definition of the term interactive art. This is exemplified in a research question discussed earlier in Chapter 4 (pp. 83-88) '*the discrepancies of play between interactive art and video games*'. Additionally in question three, Graham (see Appendix iv, p.67) argued that although there are similarities between interactive art and video games "[…] how much is the metaphor of a videogame, in which case it's a very strict set of rules for a videogame". Her argument reflects previous discussions, where Johnson stressed that the integration of mental processes and physical processes are the essence of this art form. However, for Johnson a true understanding of the word interactive has to involve one more element: experience.

Insights on the Correlations between the Analytical Framework and Meaningful Experiences

Gillman argued that artworks "may be finely crafted and may be wonderful objects in themselves, but actually they have no meaning until they are acted upon"; here the meaning or meaningfulness "exists in a forward transaction". For Gillman "the condition of art is achieved through a process of interaction", which echoes the idea of 'process', discussed above. As a result of this transaction and transformative process, a certain degree of freedom is bestowed upon the participants. Thus, meaningfulness is not didactic but dynamic in this research context. Furthermore, it is by no means an arbitrary and unrestrained association. In Q4, Johnson remarked that although the artist "may not get one hundred percent, all the time [in terms of successfully conveying artistic intent to audiences]" […] "those combinations of things [mental, physical process and experience] have to work together." Also in Q5, Chiang asserted that if you are a thoughtful artist you will not allow experience to become overly dispersed without a

boundary. This concept, to some extent, hinges on Johnson's question posed in assessing interactivity in art: (Q1), "does the work have meaning in the sense that the participant or user understands the language that the artist used". These discussions accentuate the characteristic of Accessibility.

The findings of the analysis show that Accessibility emerged slightly more frequent than the other engaging characteristics. However, this does not imply that this characteristic is capable of leading to meaningful interactive experiences alone. Instead the findings illustrate that characteristics are often manifested with their counterparts and interrelated to a certain extent. For instance, in the second case study, due to a lack of Incentive, no interactivity between the passengers and artworks was able to take place. When considering the presentation of artworks in the MRT space, Chen (Z.H) (Q2), Hu (Q2) and Chiang (Q2) suggested that the acceptance of artwork by the audience is very important, while splendid multimedia stimuli alone are insufficient to construct meaningful interaction. Both Hsiao (Q3) and Johnson (Q2 and Q4) indicated that in order to develop true or meaningful interactions, a strategy of integration of multiple measures is essential.

The features of Incentive, Transfer, and Accessibility were often concurrently raised in the dialogues. This suggests that the integration of these characteristics offers a feasible strategy for the construction of environments for developing meaningful experiences. Although the characteristics of 'Play' and 'Challenge' were not raised as frequently as their counterparts in the interviews, Hu (Q1) and Chen (M.X) (Q3) indicated that an artwork has to sustain and promote engagement, and create long lasting admiration. Also, Chen (Z.H) (Q3) and Gillman (Q5) indicated that increasing variability could be a viable approach to intensifying engagement. Additionally, the features of Play were also discussed during the dialogues with Chen (Z.H) (Q2), Chen (M.X) (Q3) and Graham (Q4), in which Play acts as a lubricant, facilitating

engagement and prompting dynamic interactivity not only between people and the artworks but also between different people. This last element of interactivity between different people is believed by Graham to be the only true form of interactivity.

Insights into the Presentation of Interactive Art in MRT like Spaces

Unlike professional art exhibition contexts, artworks in the MRT space often have involuntary audiences. Due to these conditions, a majority of the interviewees argued that the first task for the artworks intended for presentation in MRT like public spaces is to capture the passengers' attention within a short time scale. Graham (Q5) suggested that instant and easily understood feedback is needed to draw people in. Johnson (Q5) remarked "it has to be something which is going to grab their attention fairly immediately […]".

Security and maintenance are a prime concern within this research context. Robustness is also an essential requirement. Only through robustness can a functional state of Transfer be sustained by the artwork, which further affects the functions of the rest of the characteristics. Chen (Z.H) (Q5) commented that: "if the art piece […] does not work the way it should, it cannot deliver its meaning", while Johnson (Q4) noted that he finds it very annoying to see artworks suspended in a state of malfunction. Gillman (Q5) and Chiang (Q1) suggested that by employing appropriate technologies this issue could be avoided.

Accessibility is no doubt as valuable as Incentive and Transfer. It is Accessibility that facilitates dialogue between people and artworks or between different people, as it often appears through features that resonate with the community and locality. Graham (Q5) believes that the artist must have a clear understanding of the different levels of audience experience of the art and know how to get people involved in the artistic context. Chiang (Q5 and Q6) reflected these comments by asserting that there are opportunities as long as the art remains relevant to people's experience.

Although the features of Play and Challenge were not explicitly highlighted in the interviews with the three professional groups, the play phenomenon was often identified within interactions between participants and artworks. The capability of Challenge to strengthen engagement has been endorsed by literature reviews (e.g. Csikszentmihalyi 1990) as well as suggested by professionals (e.g. Graham (Q4) and Chen (Z.H) (Q5)). Additionally, it seems that both Play and Challenge often perform parallel roles and appear alongside the other characteristics.

The different characteristics were identified in each dialogue section and the frequency of their identification varied. However, this research developed on the basis of qualitative analysis of each characteristic's correlation to meaningful experience. Therefore, I do not intend to quantify the outcomes. Moreover, the numeric information is not able to fully represent the strength or necessity of each characteristic in their function of eliciting meaningful experience. For instance, it is evident that Accessibility was brought up most often within the interviews, whereas Transfer was not mentioned as frequently. This is because the Transfer may be considered a natural and self-evident characteristic of interactive art, thus it was mentioned less often.

Chapter Eight—Third Case Study in the MRT station

8.1 Introduction

After the completion of the second case study with the artwork *Poetry on the Move*, a critical review and analysis of the findings generated from the previous research activities was carried out. This led to the identification of the latest engaging characteristic: Incentive. The common incentives in this art form are usually responsive visual, acoustic or sensory elements: for instance, the sound of the maracas produced by *the Legend of the Phoenix*. However, incentives are not limited to these categories but can also take other forms such as the scooter-handlebar installation in this case study. Instead of responsive multimedia effects, the shape of the installation appears to be the major stimulus which attracts the participants' attention and urges them to further explore the artwork. The work incorporates clues: such as the scooter-handle bars, the wording of "your face shows on the screens of the happy family in front" on the operation instructions, and the images of the participants' faces suddenly materialising on the family-figure sculpture. These facilitate development of association between a harmonious family and the image of Taipei City. The discovery of Incentive allowed the formation of a more holistic Analytical Framework (Incentive, Transfer, Accessibility, Play, and Challenge), which was subsequently applied to the third study of interactive artwork *We are One Family* in Taipei, Xiaobitan MRT station. The objectives at this phase were to:

1) Disclose participants' perceptions and reactions with a different form of interactive artwork in an attempt to collate more representative interactive behavioural patterns.
2) Further investigate the established Analytical Framework and its operational status in examination of interactivity.
3) Take heed of the emergence of other potential engaging characteristics.

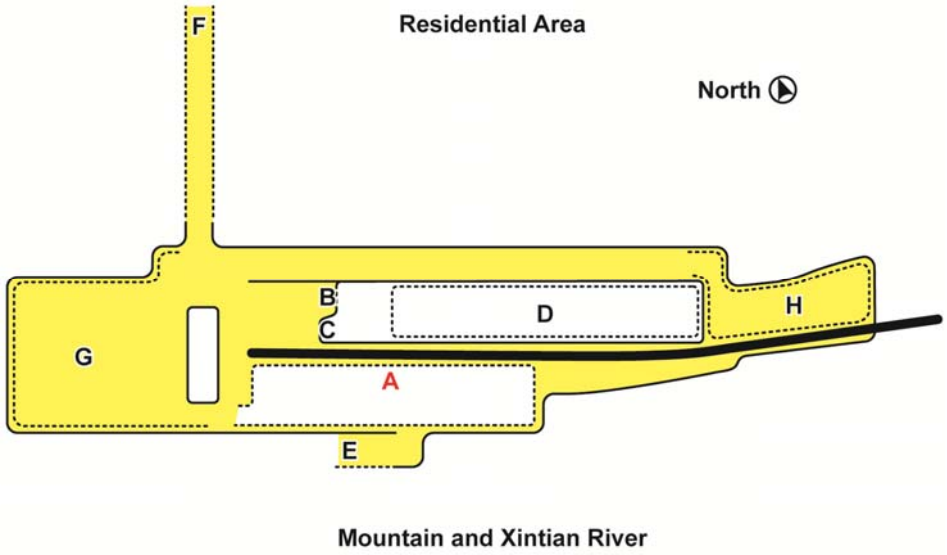
8.2 Case Study: *We are One Family*

The third case study was conducted with the art installation *We are One Family*, which has been installed at the Taipei, Xiaobitan MRT station since 2004. The study was conducted for a period of three consecutive days, four hours per day, starting on Friday 2 April 2010.

Xiaobitan MRT station is unique within the Taipei MRT network and is also one of the largest stations. It is a terminal station on a branch route off the Xindian Line. The station has four squares; the south square directly faces the mountains and the Xindian River, while the west and east squares faces the same scenery, though at an angle. Although the station is next to a residential and school area on its north side, there are tourist spots and a riverside area not far from the station. Unlike the other MRT stations, which usually function solely as transport hubs, the Xiaobitan station incorporates various leisure amenities such as a scenery observatory and an outdoor café. These amenities lead people come to the station not only for transportation but with numerous purposes in mind. Students practise dancing and singing, people exercise and walk their dogs and couples come to enjoy the mountains and the river scenery. The space functions more like a public park than a mono functional station.

The artwork *We are One Family* is installed in the south square (see Figure 8-1). It has two separate input and output sets. The input set is made up of five scooter-handlebar shaped devices that capture images of the participants. An operation instruction for the art installation[1] is found above each scooter handlebar device (see Figure 8-2). The output set is a five member family figure sculpture with LED screens fitted on their faces. People's facial images are captured and conveyed onto the screens when they press the red button on the scooter handlebars. The scooter devices imply riding towards a joyful life. As scooters are a popular transport mode in Taiwan, by interacting with them and having images of the participants face conveyed to the screens of the sculpture, the participants realise what the artist's term 'the

utopian community'. This joyful interaction is especially apparent when several people play with the art installation at the same time.



Xiaobitan MRT station site plan			
A *We are One Family*	**B** Entrance	**C** The ticket office	**D** Platform
E Exit one	**F** Exit two	**G** West square	**H** East square

Figure 8-1: Xiaobitan MRT station site plan

[1] Interactive installation operation instructions (the original text is Chinese, therefore, the instruction list below is a translated version)

1) Put your hands on both the left and right hand scooter-handlebars

2) Maintain a distance between your head and the scooter-handlebar device

3) Face the centre of the device

4) Press the red button on the right handlebar

5) Your face will appear on the screens of the happy family in front

Figure 8-2: *We are One Family*

Methodology

The methods utilised in this study were inherited from previous case studies in Fongsan West and Fuzhoung MRT stations (see Chapter 6). The matrix of the Analytical Framework is also utilised to examine the features of each characteristic that match the specific responses from the dialogue with the participants. More comprehensive interview transcripts can be referred in the Appendix (see Appendix iv, pp.84-86).

The only difference between this and earlier case studies was the way conversation was initiated with the interviewees. I adopted a mixture of methods that had been employed in the pilot studies (see Appendix ii, pp.13-29) and in previous case studies. This was because people spent more time wandering in front of the art installation and engaging with the artwork, thus interviewees were approached in a comparatively less direct fashion than in previous case studies. Occasionally I pretended to be a participant and played with the art installation alongside the others at one of the scooter-handlebar devices, or acted as a bystander to observe the participants interacting with the art installation.

In most cases, I approached the potential interviewees by asking rhetorical questions such as '*does each scooter device correspond to each screen?*' or '*how do these devices work?*' Since the method was less abrupt, people were generally willing to discuss the installations even before I told them my intention. These conditions allowed the interviews to be conducted relative smoothly. The Analytical Framework was also employed in examination of the feedback. The features of each engaging characteristic reflected in the responses are analysed and summarised below each dialogue section.

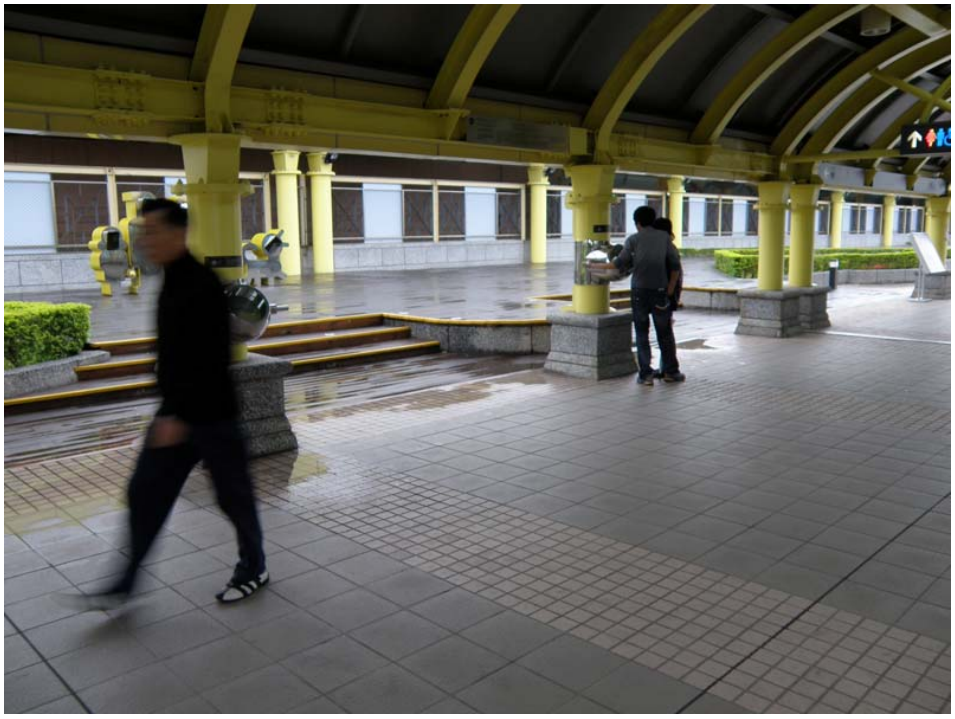


Figure 8-3: *We are One Family*

Figure 8-4: *We are One Family*

Figure 8-5: *We are One Family*

Observations in the Field

The artwork showed itself to be robust and resilient, despite having been exhibited in an outdoor environment for over five years. This may be because of the materials and simple interactive mechanisms used to create it. The images on the screens of the family-figure sculpture were low quality, appearing pixilated and the artwork has been on display for a long period of time. However, it still attracted the attention of those passing by (passengers), prompting them to interact with the art installation. Many passengers or tourists were coming to the station for the first time and many were surprised and thrilled to see their face suddenly appear on the screens.

People passed the artwork through the outdoor hallway of the south square, which is the major thoroughfare leading to exit one and to the observatory in the southeast part of the station (see Figure 8-1). People frequently slowed down or stopped to watch or play with the art installation. Many of them were in groups, either with their family or friends, this had not been seen in either of the previous case studies in the MRT stations. That may be the result of three factors:

1) People come to Xiaobitan not only for transport but also for recreational purposes
2) The artwork is purposefully designed and displayed in a tactile form that encourages people to contribute inputs for the ultimate presentation
3) The space incorporates several leisure amenities, and functions in a similar way to a park

These occurrences reflect on Senie's (McClellan 2003 p.187) statements in '*Art and its Publics*', "outside the park indifference seemed to prevail". In comparison with previous case studies, the participants seemed more willing to engage with the art installation and their physical inputs were even more apparent than those in the galleries (see Supplementary Studies, Appendix ii, pp.30-39). Many people watched others play with the artwork, while several of them randomly tested each scooter-handle bar device to view the images shown on the different screens to amuse themselves and their partners. Although the play phenomenon was evident, within the

three-day case study, no participants actively sought the artwork introduction hanging at position ‘A’ (see Figure 8-6). This may have been because the introduction is displayed above eye level. Many of interviewees reported that they did not know the introduction was there. This again suggests that audiences in such public context do not spontaneously seek artistic intent or the meaning of artworks.

Figure 8-6: *We are One Family* (the artwork introduction at position ‘A’)

Dialogue with the Passengers

Prior to embarking on the formal interviews with the passengers, non-participant observations were conducted. These helped pin down the most appropriate time for the field study. After obtaining a basic understanding of the generic activities within the space, three field study times were selected: 3pm to 7pm on Friday, 10am to 2pm on Saturday, and 2pm to 6pm on Sunday. These times were identified as people came to the venue to perform leisure activities after they finished work or school and tourists would come to the riverside and tourist spots in the vicinity during the weekend, many of them arriving either in the late morning or early afternoon.

Interview – Question 1

The participants naturally walked towards the art installation when they passed through the passageway. Their physical input was more evident in this case study than those in previous studies in the MRT stations. This raised a question of what elements appealed to the passengers' attention and further prompted them to engage with the artwork. The interviewees were asked: *Why the artwork captures your attention and which part attracts you the most?*

Summary of Response to Question 1

Most of the interviewees reported that they were attracted by the scooter-handlebar devices; their shape and how they are installed just beside the passageway (**Incentive**): a fairly easily approachable place. After engaging with the artwork, the participants were subsequently intrigued by images of their faces suddenly being displayed on the screens of the family figure sculpture (**Transfer** and **Play**). Various **Playful** interactions took place as the participants attempted to discover the interactive mechanism (**Challenge**). This on-going **Playful** phenomenon also attracted the attention of other passers-by (passengers). Many interviewees stated that they began by watching other people playing and were curious about what people were doing with the art installation.

Interview – Question 2

In general, the participants enthusiastically tested the art installation, as they were initially attracted by the shape of the art installation, the image appearing on the screen and other people playing with it. Along with the previous question, the second question further explored the participants' perceptions of the artwork, specifically concerned with their initial engagement with the art installation. The interviewees were asked: *Recall and describe your feelings when you saw and engaged with the artwork for the first time*.

Summary of Response to Question 2

Incentive, **Transfer**, **Play** and **Challenge** were revealed in the feedback of this interview session. The majority of the interviewees were seeing the artwork for the first time. Although their first impression of the art installation was that it was cool, fun and interesting, many of them reported that at the beginning they did not know it was an interactive piece or how the art installation worked (**Incentive**, **Transfer** and **Challenge**). They thought it was just a special design with an interesting, decorative finish. The presentation of the art installation including the shape of the scooter devices and interactive effects was not only triggering but also intensifying the participants' curiosity and prompting them to further engage with the artwork. This drew out the combined features of **Transfer**, **Play** and **Challenge**.

Interview – Question 3

On the third question the study intended to uncover the participants' motivations and purposes for playing with the artwork. The interviewees were asked: *Do you know exactly how the art installation works and why did you attempt to figure out how it worked?*

Summary of Response to Question 3

In the majority of cases the interviewees first encountered the object without knowing that the art installation was an image capturing device, or that there were connections between the scooter devices and family figure sculpture. The unexpected facial images suddenly showing on the screens intrigued the participants and urged them to further explore how the art installation worked (**Challenge**). Although none of the participants actively sought and learned of the existence of the artwork instructions, the operating instructions attached above each scooter-handlebar device detailed the five steps in operating the devices. However, this did not explicitly state that the scooter-handlebars were image capturing devices and that images of the participants' faces would be transferred onto the screens. It simply noted that: '*your face will*

show on the screens of the happy family in front' (**Transfer** and **Accessibility**). This provided clues allowing activation of interaction in which subtleties relating to the works mechanisms were embedded, urging the participants to explore (**Challenge**). Several participants actually thought the scooter device itself was the screen and they were expecting to see things appear there. Although the instructions provided somewhat vague information on the operation of the devices, this vagueness accidently became a functional strategy to draw people into the context by providing a sufficient stimulus. This increased both **Accessibility** and **Challenge** in the artwork, allowing the participants to discover the rest of the variations themselves.

Interview – Question 4

Physical involvement and interactivity was manifest both between people and the art installation and between different people. This brought the case study back to the primary research question '*Whether the participant is able to obtain a meaningful experience through interaction with interactive artwork?*' Based on this fundamental enquiry, the interviewees were asked: *Can you guess the meaning of the art represented? Does the representation of the art installation prompt you to seek its meaning?*

Summary of Response to Question 4

The wording 'happy family' written on the operating instructions (see Figure 8-2) provided a hint to the participants, as did the family figure sculpture. These lead the participants to develop their own associations with a joyful family or other connections with the locality, such as the familiarity of scooters in Taipei city (**Accessibility**). Many interviewees reported that they associated the presentation of the art with a happy family. However, as none of them were interested in looking for the artwork instructions they were not greatly concerned with the actual meaning of the artwork. They described their intentions as to **Play** with the artwork merely for fun and amusement. The interviewees reported that they either did not care about the meaning of

the artwork or they did not have time to concern themselves with it. These results again highlight the nature of the passengers in the MRT space.

Analytical Framework	Order of the Questions	Response of the interviewees (XB number, (sequence of being interviewed))
Incentive	Q1:	- [...] the image suddenly popped up (XB01) - I saw other people kind of playing with it, it seemed quite interesting. (XB05) - […] it looks like a scooter (XB10)
	Q2:	- I thought it was just a special ornament (XB03). - I was wondering if this scooter installation was a screen which provided some kind of information (XB07).
	Q3:	- I was expecting that maybe images or messages would appear on it (XB03) - It seems fun because other people were playing (XB15).
Transfer	Q1:	- […] so I tried and I found the outcome was very interesting (XB01).
	Q2:	- the participants' curiosity and prompting them to further engage with the artwork (Overall)
	Q3:	- I was very curious and wanted to know how it worked (XB03). - I'd like to see the results on other screens too (XB11).
Accessibility	Q3:	- I was not sure how it worked but it wasn't difficult (XB15).
	Q4:	- It seems like it represents an idea of happy families. I have just seen 'family' written on the small artwork operation instructions (XB03). - I feel it sort of portrays the image of a harmonious family (XB05). - I guess it is about parking scooters, because the scooter is a common means of transport in Taipei; I guess that is the meaning of it (XB07).
Play	Q1:	- (see Q1, Transfer (XB01))
	Q4:	- this kind of work only amuses you (XB02) - it is just fun, interesting (XB03). - it is simply for amusement (XB05)
Challenge	Q1:	- I was a bit curious why they are made like this and why they are placed here? (XB01) - Also see (XB01 at Q1) - I felt curious as to why they were placed here (XB10).
	Q2:	- you are standing here but your images are showing up there, I was very curious (XB01). - it's fun as it is scooter-handlebars, but I did not expect an image to show up there (XB07)
	Q3:	- (see Q3, Transfer (XB3 – XB11))

Figure 8-7: Correlation of the engaging characteristics and the responses of the passengers

8.3 Summary

Features of the five engaging characteristics were evidently displayed within the study of this artwork (*We are One Family*). Strictly speaking, the interactivity between the audience and this art piece is activated only when the participant presses the red button on the scooter-handle bar devices. Nonetheless, the shape and presence of the devices themselves function as an overarching 'Incentive' to draw the participant into the context of the art. Unlike the previous artworks studied, this art installation (*We are One Family*) requires direct physical involvement from the participant to trigger the initial visible and responsive effects.

The shape of the art installation plays an instrumental role in engaging and enticing people to put their hands on the handle bars, achieved because the scooter is an iconic object that people are familiar with in Taiwan. This highlights the feature of Accessibility. The participants were initially thrilled and wondered how their face images appeared on the screens of the family figure sculpture. This unanticipated but evident responsive furthered their curiosity and prompted them to explore the devices with diverse approaches.

They not only allowed their faces to be captured but also testing the mechanisms with other objects and used different scooter devices, experimenting to see what images will be displayed on the screens and how they will be displayed. These interactive occurrences unreservedly display the features of Transfer and Challenge, as the participants' curiosity was obviously augmented. A playful and interactive ambience evolved that also attracted the attention of passers-by (passengers) and encouraged further waves of hands-on engagement.

Chapter Nine— Re-examinations of the Three Selected Artworks and the Interview Contents

9.1 Introduction

The initial Analytical Framework of three engaging characteristics (Dominance Transfer, Mind-Orientedness and Accessible Challenge) originally emerged from several informal field observations conducted in the MRT stations and from literature reviews of relevant studies of interactive experience. Through repeated examination of the interactive artworks, examination of the participants' interactive experiences, and the insight of the professional interviewees, the two characteristics (Play and Incentive) were subsequently identified.

The Analytical Framework thus far has developed with the five engaging characteristic (Incentive, Transfer, Accessibility, Play, and Challenge), this allows a more comprehensively examination of the interactivities. This latest version of Analytical Framework was applied to reexamine the three selected artworks (*The Legend of the Phoenix*, *Poetry on the Move* and *We are One Family*) and the interview contents of the professional interview groups. The outcomes produced in this chapter elucidate the features of the five engaging characteristics and further substantiate the usability of the Analytical Framework.

The definitions of the five engaging characteristics were formally proposed in ISEA2010 Ruhr Germany, which substantiated the practicality of the Analytical Framework in terms of investigating interactivity in the proposed research context. It is envisaged that demonstrating the uses of the five engaging characteristics in examination of the individual interactivities will facilitate adaptation of the Analytical Framework, for use by art practitioners and researchers of interactive experience.

9.2 Incentive

(See the definition of '**Incentive**' in Glossary, p.xiv) When discussing exhibiting interactive artworks in non-art public spaces, the majority of the professionals interviewed prioritised the ability to capture the audience's attention and enable them to learn ways to interact with art installations within a short time scale. For instance, Gillman (interview: see Appendix iv) asserted "The user should be able to detect that it's interactive and know how to interact very quickly. So there's a kind of time limit". During the preliminary stages of this research, this characteristic was considered a self-evident element in creating and presenting interactive art in public settings. However this appeared to be a misconception as having responsive multimedia effects does not guarantee the capability of engaging audiences effectively, which is why 'Incentive' was established as the last characteristic.

My initial conception of this characteristic is also reflected in the literature review, which identified no identical argument in adjacent research. These findings suggest that 'Incentive' may have long been treated as an obvious feature of interactive art and it may not necessarily be explicitly stated. This misconception often leads to ignorance of this characteristic or the use of inappropriate methods to realise it within the creation of art installations. This ignorance may also be a result of a lack of research specifically conducted in similar non-art public contexts. Indeed, while many artworks possess sufficient incentive to adequately engender an initial and spontaneous interaction, a number of works suffer from its absence.

***The Legend of the Phoenix*:** the sound of maracas was trigged when the passengers stepped onto the escalator or the stairway. The passengers lifted their heads, trying to determine where the sound was coming from and wondering how it was being generated. A few of them even stopped on the staircase and looked up with their fingers pointing at the rotating maracas. Though the passengers did not act with explicit gestures and movements, the interactivity

between them and the artwork was already being established. The pertinent acoustic interactive effects attracted passengers' attention and their curiosity was heightened which led them to further explore the artwork.

***Poetry on the Move*:** the 'Incentive' was not properly embedded, as initially the participants did not know that they could send messages to the artwork, thus interactivity and the artistic intent of the pieces were not embodied until participants were told that they could do so. Nevertheless, as soon as they saw their messages displayed on the LED bulletin the interactivity was manifested. Gillman (interview: see Appendix iv) remarked "I think interactive works have to have their rules implicit within them and they should be legible", allowing the participants to 'read' them as soon as they begin that process of engagement.

***We are One Family*:** does not produce any multimedia effects prior to hands-on intervention from the participants. However its scooter handlebar shaped devices effectively attracted the attention of passers-by, in particular because of the familiarity of this scooter device to a Taiwanese audience. This familiarity, together with its presentation along the hallway, an easily accessible location, made the art installations beckon the passers-by (e.g. passengers) to touch them. The participants were subsequently intrigued by their facial images suddenly appearing on the screen of the five-member family sculpture, which prompted them to further interact with the artwork.

Discussions of issues of non-physical interaction arose from the interaction between the passengers and the artwork *Poetry on the Move*. Gillman's (interview: see Appendix iv) comments in the interview on this subject suggested:

> The work needs support and the question is then how you provide that support. […] it's not telling you what the work is going to do; it gives you enough of a trigger to experiment

> and then you begin to learn how the work functions. But unless you have that, there's no way in. […] it's about providing the steps that allow people still to have an open field to engage with the work, but actually they can get close enough to begin to see what's possible.

'Incentive' plays an instrumental role in leading audiences to develop successive interactivity. Nevertheless it has to be strategically applied to the creation of interactive artworks that are to be presented in specific public contexts. If this is not done, the work may not be able to adequately display artistic intent or even worse, the inappropriate application of 'Incentive' could lead to counterproductive effects. For instance, with *Peep* in the Gongguan MRT station, no passengers raised their heads to watch the screens fitted beneath the ceiling directly above the platforms (see P.45). With *Time-Splinter* and *86400* in the Yongning MRT station, only a limited number of the passengers walked into the exhibition halls (see p.52) and even then it was with the intention of finding a quieter place to speak on their mobile phones. The music of the carrousel horse piece *Around* in the Kunyang MRT station (see Appendix i, Figure 4) had to be turned down after local residents complained. *Bigpow*, three robot-like artworks installed outside the Zhongshan MRT exit R4, suffered a similar fate (see Appendix i, Figure 17). People living in the surrounding high rise building complexes asked the administrative unit to move the pieces elsewhere. Unlike The *Legend of the Phoenix*, both *Around* and *Bigpow* are installed within residential areas. As acoustic based interactive art installations which produce music or sound effects, these two pieces received complaints soon after they were installed.

9.3 Transfer

(See the definition of the '**Transfer**' in Glossary, p.xiv) The magical power of transformation is understood to be the nature of interactive art. This power is deliberately incorporated to allow the participants to unfold narratives and to embody the artwork. The creative process does not exercise complete control over the artwork and a work is never entirely completed by the artist alone. Indeed, 'creative authorship' (Murray 1997 p.152) is shared between the artist and the participants. The participant is navigating through something they are inside, rather than examining externally. Huhtamo (2004) argues that this 'active role' is an indispensable element in turning the spectators' contemplative and passive appreciative manner into active engagement. He also points out that this active nature is often raised as a criticism of interactive art by traditional art critics; however what has been termed 'active perception' and the interaction claimed to exist in conventional art forms usually remain within interpretations of eye and mind, rather than traversing haptic and physical dimensions. Graham (interview: see Appendix iv) echoes this notion and remarks that there are fundamental discrepancies between a merely psychological resonance and a sensory perception. The concept is, to some degree, reflected in the three levels of users' experiences (Visceral, Behavioural and Reflective) noted by Norman (2005), As part of this distinction he separates 'Visceral' and 'Behavioural' experience. The Visceral relates to how products are mentally perceived, while the Behavioural concerns the uses of products that touch on both physical and tangible perspectives. These discussions suggest that a combination of physical involvement, an active nature and the power of transformation is the entry point to the journey of navigating and experiencing interactive art.

***The Legend of the Phoenix*:** some participants discussed the sound of the maracas with their friends while others queried where the sound was coming from. Although not consciously, their bodies were acting as physical tuning devices for interactivity. During this process the meanings of the artwork were being formed through participation. Gillman (interview: see Appendix iv)

stated “we bring our own experience to something and we take away our own experiences.” Through experience and interaction, meanings are generated and may be perceived and interpreted by the participant.

***Poetry on the Move*:** after I notified the participants at the station that they could send messages to the bulletin, several of them started trying to send messages while the interviews were still proceeding. As soon as the messages were displayed on the bulletin control was unleashed and transferred to participants, meanwhile other messages were sent from elsewhere. This indicated that other anonymous participants also sent messages while the interviews were in progress. These phenomena are reflected in the characteristic of ‘Agency’. This was proposed by Murray (1997) as the ‘satisfying power’ that we feel when taking ‘meaningful action’ and seeing ‘the results of our decisions and choices’. Agency has the potential to fulfil an artist’s intention of triggering dialogue within society. Mobile phones and the bulletin board are different message carriers; the former has a private quality, whereas the latter usually takes a more public form. Transfer is presented in a subtle way in this art installation, implicitly connecting individuals and the community. Additionally, it encourages the intimacy of personal communication while retaining anonymity.

***We are One Family*:** the screens fitted on the family sculpture appear black when no inputs are inserted from the participants. As soon as the participants pressed the red buttons on the scooter handlebars, various interactivities were triggered. The participants were immediately attracted and perceived unexpected feedback on the screens. In the ideal presentation of this art piece, several people would operate the devices simultaneously and allow their facial images to be captured and displayed on the screens; the meaning of this artwork (defined by the artists responsible as a utopian community) would then be embodied. Though there were not always five people interacting with the instillation, during the field study, I noticed that on several

occasions people played on the different sets of scooter devices with the other participants even if they did not know each other.

The combination of the active principle and transformation forms the essential nature of the three artworks studied. These features invite the participant to experience the art rather than simply visually witnessing it. The processes of interactions are central to manifesting its potential, deemed the essence of the work. The artistic intent of these three art pieces cannot be realised if the power of transformation is not sufficiently asserted. During discussion of the interactivity of this art form with Gillman (interview: see Appendix iv), he mentioned, “the idea is not that interesting but the actual experience is. But the experience only works if it is actually played out in that way. […] how the interactivity takes you to a place that is interesting rather than saying OK I’ve now seen something that is interactive.”

9.4 Accessibility

(See the definition of the '**Accessibility**' in Glossary, p.xiv) Rokeby (Penny 1995 p.138) coined the term 'navigable structures'. Instead of implanting affirmative subjectivity into creative arts, artists provide clues and pave variations of narratives, allowing the participants to explore and establish personal interpretations within the context of an artwork. In the same essay Rokeby (ibid p.140) noted that "The constraints provide a frame of reference, a context, within which interaction can be perceived". However, this does not mean that one has to have a clear goal to accomplish or to reveal. Instead, it gives enough prompts to lead the audience to obtain their unique rewards. Ascott (2001 p.66) states "consciousness is more to be navigated than mapped, and more to be reframed than explained". Dewey states (1997 p.58) "The planning must be flexible enough to permit free play for individuality of experience and yet firm enough to give direction towards continuous development of power".

***The Legend of the Phoenix*:** the combination of the sound and shape of the artwork triggers the passengers' consciousness of and sentimentality toward their hometown. Many interviewees reported that they felt the shape of the art installation had some sort of connection with the place. While some indicated that they could tell the art installation somewhat resembled a phoenix and were interested in finding out the meaning of it. As has been noted (interview: see Appendix iv), during the field study in the station, the interviewees (FS08) reported "the sound was like the call of a phoenix." (FS07) "I do not know the meaning of the artwork, but I thought if it may have some sort of association with time or train schedule, something related to the MRT maybe, as I felt there was a rhythm in the sound and flow in the form of the artwork."(FS15) In this interpretation the presentation of the artwork represents a vision of the future Kaohsiung MRT network.

***Poetry on the Move*:** the accessibility of this art piece only became manifest and its meanings revealed when the participants were told they could send text messages to a dedicated phone number and see the results displayed on the bulletin. The artistic intent of this art installation is to invite the passengers to share their thoughts with others in the stations through the interactive LED bulletin. In other words, the significance of this artwork was not bestowed on the piece when it was created. It is resonant to and activated by the passengers. After one of the interviewees was told the interactive function of the art piece, the latent meanings were realised, they (FZ07) said: "I think the meaning of this art piece depends on what is written on it, therefore this artwork does not have a single meaning, and instead its meaning should be determined by each individual who sends messages to it" (interview: see Appendix iv).

***We are One Family*:** as has been noted in Chapter 8, several participants expressed that they would not make much effort to figure out the meaning of the art pieces. Indeed, the artwork *We are One Family* is not the sort of art that requires in-depth contemplation. Instead the physical participation and physical form of the installation serve as the key to disclosing the narratives of the artwork. The choreography of the interaction, the incorporation of the scooter shaped image capturing devices, the wording 'happy family' on the artwork operation instruction panel and the facial images conveyed on the family sculpture together lead the participants to develop their associations with familiar images (the traffic of the Taipei city and with the idea of harmonious families). Though those interpretations might not exactly match the original artistic intent of achieving a 'utopian community' in every single interaction, it does facilitate the elicitation of experiences within a broader art context.

Johnson (interview: see Appendix iv) stated:

> You're not always going to hit every single audience and convey your idea to every single person. Some people will take different things away from the experience. It comes back to

this notion of how you interact with the artwork at different levels, whether it's through play or whether it's through a deeper level of understanding of what the artwork is about.

Both the first (*The Legend of the Phoenix*) and third (*We are One Family*) artworks provided sufficient 'Accessibility' with their presentations to prompt the participants to develop their individual interpretations and reflect back on the artworks. The process could be termed 'intellectual reconstruction'. The idea is derived from Dewey's (1997 p.64) view that "Natural impulses and desires constitute in any case the starting point. But there is no intellectual growth without some reconstruction, some remarking of impulses and desires in the form in which they first show themselves."

9.5 Play

(See the definition of the '**Play**' in Glossary, p.xiv) It was mentioned earlier that perhaps the 'active principle' play is often identified with the interaction between the participants and interactive artworks. As this observation has been recurrently raised, a question frequently asked of this study is: '*What is the discrepancy between play in interactive artworks and play in video games?*' This, to some extent, shows the unbreakable bond between 'play' and 'interactive art'. Nevertheless, in discussing the influences of play in interactive art with the artists, there seemed no consensus of acceptance among them that play is a functional element which tempts the audience to engage with the artwork. This may be because imbuing a work with a temptation to play is not regarded as an ultimate artistic intent, but a measure to prompt participants to engage at a higher conceptual level. The findings of the case studies indicate that by adding 'play' as an ingredient into the creations of art, the intention moves beyond superficial sensory perceptions and physical participation, adopting a higher purpose of leading the participants to discover artistic intent or develop more fulfilling rewards.

Gillman (interview: see Appendix iv) mentioned "you don't know how you did it, what the consequences of your actions might be. But then you start to play with it and by playing with it you create effects, and part of the interest is in learning how to control that space, but also it's just a very sensual effect of what you see and what you hear." Johnson (interview: see Appendix iv) also stated that "all interactive works engage people at different levels, so that there are elements of play which come into the process. You can engage with a piece of work in a playful way so you might just see what something does and then come back to it and maybe try a bit later." 'Play' serves as a functional characteristic in this art form and playful phenomena are frequently identified, despite their inconsistencies in potency or degree of manifestation in each interactive artwork.

***The Legend of the Phoenix*:** the passengers stepped back and forth on the staircase attempting to figure out where the sound was coming from. Several of them watched for or pointed at the rotating maracas, as well as discussing the interactive mechanisms and effects with their partners. Although the participants' body movements and physical inputs were moderate, through those implicit explorative activities, play behaviours and interactivity were established.

***Poetry on the Move*:** in interview E-Chen (interview: see Appendix iv), the artist behind *Poetry on the Move*, stated that, although play could be a stimulus, he had never considered how to craft 'good play' with his artwork since he felt that it would never be as fun as videogames. Indeed, the play phenomena appeared fairly reserved and non-exposed within his artwork; however, it is undeniable that it does exist and act as a process of exploration. This pattern of play in this artwork reflects on Reeves's (2005) 'low manipulations and low effects' category, also in what I previously proposed 'implicit play' (see Appendix vi, pp.138-143). Through sending messages to the LED bulletin, the passengers contribute and share their thoughts with other people inside the station. The participants, and a number of the passersby (the passengers), began reading messages as soon as they were displayed on the LED bulletin, while others kept typing on their mobile phones. The messages' contributors remained anonymous during the time they were interacting with others in the station and at other locations within their community. During an interview with Graham (interview: see Appendix iv), she asserted that hosting interactions between people while retaining their privacy is a very clever interactive strategy, exemplifying this with the interactive installation *Resonance of Four*. This may reduce feelings of intimidation since some people may not be keen to expose themselves during the process of interaction, making it a potential impetus for a more dynamic presentation.

***We are One Family*:** in comparison with the first and second case studies, play phenomena were relatively explicit within this art installation. The participants tested each scooter handlebar

device to view the results displayed on the screens, while several took pictures of themselves with the family figure sculpture. In an attempt to see what would be displayed on the screen, one participant even used the scooter device to capture an image of a plastic bottle he was holding in his hand. Perhaps due to the nature of the space, the participants in this case study were often in groups, either with their partners, or with family or friends. Thus discussions of the devices, interactive mechanisms and effects were frequently raised between them.

During interview Chen (Z.H) (interview: see Appendix iv) stated that it is not enough to only have amusing effects. The artwork has to exhibit its features, belongings and display its specific localities. Chiang (interview: see Appendix iv) argued, though play can be very useful in terms of providing clues for the participants and triggering interactivity, if there were to only be play, art would not be needed. Although play may not be seen as an explicitly essential element of creative art, it is frequently identified as a latent gene of this art form. Rokeby (Penny 1995 p.139) in Penny's '*Critical Issues in Electronic Media*' states "people sometimes feel irritation when faced with an interactive artwork, because they feel that their 'behaviour' is being judged." This highlights the importance of play in interactive art, as the definition has been made earlier in this research that play is a key component that functions as an ice breaker prompting explorative interactivity.

Chen (Z.H) (interview: see Appendix iv) raised an interesting notion regarding play. He claimed that there is a dilemma as it is not easy to manipulate play. Though play is capable of enticing audiences to approach artworks, too much amusement may result in participants forgetting that what they are viewing is a form of art. Graham (interview: see Appendix iv) also remarked that playfulness is very important, however, good playfulness is quite difficult to achieve. These discussions indicate that 'play' is a crucial component in terms of arousing dynamic interactivity. Nevertheless it needs to be appropriately crafted when utilising it in interactive arts.

9.6 Challenge

(See the definition of the '**Challenge**' in Glossary, p.xv) Challenge has a twofold effect within the themes discussed in this research. The first proposes that it acts to realise a work. Computer-based interactive art challenges perceptions and experiences of art by "addressing the viewer directly and involving her/him in a dialogue" (Dinkla 1994). I consider this a challenge to the audience, as they may not be accustomed to the methods of encountering artwork as, in general, audiences perceive artworks as static, untouchable objects. Additionally, responsive, interactive effects are usually unexpected when appreciating artworks, these to some extent alter the way of viewing the art. In the expert interview Gillman (interview: see Appendix iv) stated:

> We confuse audiences a lot because in an art gallery situation, very few art galleries say we are an art gallery that always shows works that you can play with. You know, an art gallery will show a work that you can play with one month, next month it's something you can't touch because it's too precious, the month after something that is an object that's actually quite touchable and not too precious, but actually the value of the work is not in touching it and playing with it, it's actually in standing back and looking at it. So we're not always explicit in that and I think different artists have got different takes on that, so it can be quite complex for audiences.

The second effect is derived and built upon the first feature, in which the experience prompts curiosity that may encourage the participants to further explore the narratives of the artwork. In the discussion of 'Flow', Csikszentmihalyi (1988 p.30) remarked with regards to 'Flow': "[…] every activity might engender it, but at the same time no activity can sustain it for long unless both the challenges and the skills become more complex". 'Flow' may not develop or may not even be expected to occur in this research context, as it was noted by Csikszentmihalyi (ibid) himself that flow activity rarely occurs in everyday life. His theory does, however, offer some

insight that may aid construction of a deeper engagement. Graham (interview: see Appendix iv) also suggested “if there were enough levels of complexity then it could possibly get a cult following. People would come back and come and perform with it”. Based on these discussions, in order to engender “optimal experience” (ibid pp.1-8), a viable strategy must be used to sustain the participants’ curiosity.

Indeed, the second effect of the challenge may not always be demanded, as they depend on how the artists present their artworks. Gillman (interview: see Appendix iv) indicated that, “Not all of us want to be constantly challenged. Not all of us want to be constantly seeking the experiences.” His argument is explicitly reflected in the findings from the observations and interviews in the case studies, as the majority of the passengers in the MRT stations did not spontaneously seek artistic experience. Nevertheless, this highlights that an adequate level of challenge may function as an impetus to encourage further engagement with the artwork and allow the participants to obtain meaningful experiences involuntarily through the interactions.

***The Legend of the Phoenix*:** the passengers were curious when they heard the sound of the maracas. Although a number of the interviewees reported that they were interested in learning the meaning of the artwork represented, in most cases, the passengers behaved indifferently and no follow up actions were made. The findings suggest that their curiosity was not fully aroused. This may be the result of two factors: 1) perhaps people had become bored as they had already encountered the artwork several times and 2) no further physical input was required to trigger more dynamic interactivity. A similar occurrence was also detected within the supplementary studies (see Appendix ii, pp.30-38), in which it was noted that ‘The artwork was designed for a single participant, although it also worked for multiple participants, the effects being produced were identical to when there was only a single participant.’ However, these two factors may also contribute to the default form of artistic interaction, in which no further active participation is

required. The findings from the field study show that, although interactivity is triggered when the passengers pass underneath the art installation and a number of them were able to associate the presentation of art within the art context, the majority of the participants were unaware the artwork was an interactive installation. Their associations developed based on the shape and acoustic effects of the art installation. When this was put to Hsiao (interview: see Appendix iv), he replied:

> True, the issue does exist. The audience may lose interest in engaging in the artwork because the same 'script' is repeatedly played with no further variability. However, I have never deliberately thought about this. In considering the 'Challenge', I would say maybe this would be achieved by increasing the levels of playfulness, but if increasing challenge meant increasing the complexity or difficulty of the operational interface, I would insist that the simplest is the best. For example, concerning the piece 'piano staircase' you mentioned, the artwork itself is pretty simple, but it allows the audience to create their own play on a basis of simple operational mechanisms and from there, derive great diversity; again the same principle is applied to what you talked about when playing with LEGO bricks. In addition, you have to be aware of the context. What the passenger cares the most about is that their train is arriving soon.

***Poetry on the Move*:** its interactive mechanism is comparatively more sophisticated than the other artworks in this research, giving it the potential to be the most engaging piece. The passengers send messages to share their thoughts with others, while retaining a sense of anonymity and distance. The interactivity here does not only exist between the art installation and the participant, but could be extended to between people and their community. However, the feature of Challenge in this art installation was revealed only when I told the participants how the installation worked. This suggests that the Challenge was not sufficiently composed

within this artwork. According to the findings from the case study, this also resulted from a related lack of other essential characteristics such as Incentive. The question of increasing Challenge in order to sustain the curiosity and attention span of the participant was also raised to Chiang. Though Chiang (interview: see Appendix iv) replied, “increasing Challenge may not be suitable for public contexts, in particular the MRT space.” In comparison with the first and second case studies, the feature of the Challenge in *We are One Family* was relatively evident as a route to engagement. It was adequately embedded, simultaneously retaining the participants’ curiosity, and provoking playful interactivity with attempts to uncover the hidden magic.

***We are One Family*:** the participants were initially bewildered and their curiosity was provoked by both the scooter handlebar devices and the people who were interacting with the art installation. This encouraged passers-by (e.g. passengers) to engage with the artwork and further enter the context of the art. By observing other participants’ interactions, the bystanders learned briefly how the artwork worked; over the process of experimentation and exploration they also became participants and actively discovered the interactive possibilities of the art installation. Several of them tested each scooter handlebar, some moved back and forth between the family figure sculpture and the scooter handlebars several times with the intention of viewing the result displayed on the screens and deciphering the interactive mechanism hidden behind it. Throughout the interactivity, the participants’ initial curiosity gradually evolved into fulfilling experiences and a number of them even took pictures of themselves with the artwork.

9.7 Summary

The Analytical Framework was mainly devised to investigate the interactivity between interactive artworks and participants in public spaces similar to the MRT. The framework has been utilised to examine what has been termed the world's largest glass artwork *Dome of Light* (see p. 56). However, while there were valuable observations identified through the analysis of this piece, the artwork could not be fully examined by this framework. This was due to the static nature of the artwork, which does not exhibit the same interplay qualities as the other art installations studied. Thus, apart from Accessibility, the other engaging characteristics are not specified within the analysis of *Dome of Light* (see Appendix vi, pp.130-137). Graham (interview: see Appendix iv) indicated "I'm sure you can look at a painting and see a narrative or whatever. That is different to something where you are controlling the work". The Analytical Framework was more vigorously applied to examine *The Legend of the Phoenix*, *Poetry on the Move* and *We are One Family* than *Dome of Light* as the participants' physical input is an essential component of these art installations. Different levels of Incentive, Transfer, Accessibility, Play and Challenge, have been identified through investigations of these computer-based interactive artworks and the results show that these characteristics are crucial elements that may be collectively taken to constitute Meaningfulness and Interactivity.

While each characteristic has its own distinct features, they often appear to overlap as the boundaries between them sometimes seem blurred and permeable. This may result from the correlative nature of such analytical frameworks, as the performance and intensity of each characteristic to some extent affect each other. For instance, the majority of the participants did not realise that the sound effects (*The Legend of the Phoenix*) were activated by their movement, which suggests that the characteristic Transfer was not properly incorporated into this art installation. This may have been one of the factors which led to the original artistic intent not being fully exhibited. Whilst due to the lack of an overarching Incentive with *Poetry on the*

Move, no spontaneous interaction took place and the remaining four characteristics could not take effect. This correlative quality is also identified in similar analytical frameworks for interactive experience. For instance, in Janet Murray's (1997) three aesthetic characteristics, each of their features is partially possessed by the others and their performance closely co-dependent on one another.

In summary, in terms of facilitating the participants' ability to obtain meaningful experience, the importance of these characteristics has been recognised and their viability has been extensively examined. However, these characteristics may not always appear simultaneously in an artwork. Instead, they often appear in incomplete sequences, which, to some extent, influences the levels of developing experiences. Additionally, the discrepancies of magnitude in each characteristic can also vary from one art installation to another. The impact of these variations needs to be investigated on an individual basis in order to further examine the application and usability of this Analytical Framework in the analysis of interactive experience.

Chapter Ten — Conclusion and Further Studies

10.1 Introduction

With the aim of promoting meaningful interaction between participants and interactive artwork exhibited in the MRT and analogous public contexts, this research set out to:

1) Reveal crucial characteristics that may elicit meaningful experiences and integrate these characteristics into an Analytical Framework for examining the interactivity yielded within the research context.
2) Develop a feasible methodological strategy to investigate the interactive experiences that occurred between participants and interactive artworks in the MRT space.
3) Obtain insights from professionals, artists and participants, and the first-hand experiences of the participants in engaging with the artworks during real encounters in the MRT stations.

Through analysis and comparison of the perspectives and experiences gleaned from this research, significant references emerged. These could provide vital information for the creation of future interactive artworks intended to be presented in similar public contexts. Summarising the previous chapters, this final chapter consists of three sections:

1) Conclusion: to sum up the rationale of the research and the review both the findings and the evolution of the methodologies.
2) Recommendation: to suggest areas for development in future research and the possibility of expanding the Analytical Framework.
3) Contributions: to briefly recapitulate the application and usability of the Analytical Framework in the research of interactive experience.

10.2 Conclusion

> Because of the vague and pervasive use of the term ‘interactivity’, the pleasure of agency in electronic environments is often confused with the mere ability to move a joystick or click on a mouse. But activity alone is not agency. For instance, in a tabletop game of chance, players may be kept very busy spinning dials, moving game pieces, and exchanging money, but they may not have any true agency (Murray 1997 p.128).

This argument was corroborated by several field observations prior to the formal commencement of the study. This issue served as the instigation of this research, in which the fundamental question was identified: *Whether members of the public (e.g. passengers) are able to obtain a meaningful experience through the interaction with interactive artwork in the MRT station?* Corporeal participation is one of the key features of this art genre; through physical and active involvement the participant may develop meaningful or fulfilling rewards. However, such participation is not a constant condition. Instead, based on the initial hypothesis drawn from informal field observations in the MRT stations, it seemed that despite investing physical inputs the feedback participants received was very limited. The participants’ disclosure of what they obtained through the interactions with the interactive artworks offered a valuable opportunity to gain insight for this research. This research was embarked on by deconstructing the phenomena of interaction described above, the ultimate objective being to uncover the crucial elements that may bridge physical and psychological engagement so as to provoke meaningful experiences.

Unlike the adjacent studies conducted either in galleries or laboratory settings, this research was highly context oriented: specifically focusing on interactive experience that took place in transient non-art public spaces. The two MRT systems (Taipei and Kaohsiung) in Taiwan provided a natural research setting due to there being several computer-based interactive artworks already exhibited in these spaces. As only a handful of studies have touched on similar

research contexts, this research is unique, it's the study's findings therefore have the potential to offer significant assistance to art practitioners and relevant parties who are planning to present such artwork in similar public spaces.

This uniqueness also raises a certain challenges, in particular, the construction of adequate methods for collecting research data and evaluating interactive experiences. Thus, following the preliminary informal field observations and literature review, the research set out two parallel developmental trajectories:

1) Tailoring appropriate research methodologies to deal with the task of data collection in the upcoming field studies in the MRT stations.
2) Developing an analytical research framework for the examination and analysis of interactive experiences generated within the proposed research context.

The analysis of the findings from the previous informal field observations and the literature reviews produced the rudimentary methodological tactics and the three engaging characteristics (Dominance Transfer, Mind-Orientedness and Accessible Challenge). Both have been reiteratively reshaped and informed over the course of the research and reapplied into each research phase (see Figure 1-1, the graph of interrelationships of methodological phases).

Phase of Testing Methods and Establishing Initial Analytical Framework

As there is very little similar research on interactive experience in public spaces, the testing measures were prioritised to reduce the risk of inadequate uses of methodologies. Instead of directly delving into the proposed research context (the MRT space), the study phase began with phase one: pilot studies (see Appendix ii, pp.13-29). The major objective in this phase was to test the feasibility of the initial methodologies. In addition it was necessary to remain vigilant for potential new features of engagement that may be uncovered, and to examine the three initial engaging characteristics previously identified. Throughout the course of this initial research

stage, various playful activities were constantly emerging, which to some extent influenced the way the participants interacted with the art installation. The findings manifested the characteristic of Playfulness (see Glossary, p.xiii), a phenomenon also supported by the literature reviews (e.g. ‘active principle’ (Huizinga 1955) and ‘active role’ (Huhtamo 2004)). The first pilot study revealed a number of limitations. However, the review of this study contributed subsequent constructive amendments which led to a more useful second pilot study. The criteria (see p.68) for selecting the artworks for the research were also established after comparing the two pilot studies.

In order to maintain reliability and variability of research, I selected the three artworks: *The Legend of the Phoenix*, *Poetry on the Move* and *We are One Family*, all exhibited in MRT stations, and all possessing different interactive features and mechanisms. Additionally, as evidenced by interviews with relevant professionals, resilience and robustness of the artwork (an ability to be exhibited for a long time in the space) is one of the basic requirements for selection of artwork for exhibition in the MRT. The three artworks demonstrated stable functional conditions and met with exhibition requirements. This made them ideal artworks for this study.

Phase of Disclosing Experience and Mapping Insight

The prime objective of this phase was to disclose and obtain first-hand interactive experiences generated within the MRT space, so as to allow examination of potential elements that were capable of evoking meaningful experiences. Thanks to the pilot studies, the subsequent case studies (*The Legend of the Phoenix* and *Poetry on the Move*) were successfully carried out. In order to enhance the clarity and consistency of language and terminology employed; the four engaging characteristics were amended to Transfer, Accessibility, Play and Challenge. Furthermore, after carrying out extensive analysis of the outcomes from the second case study

(*Poetry on the Move*), the factors that led to the inaccessibility of the artwork allowed the identification of the final characteristic: Incentive.

The significance and practicality of the five engaging characteristics were subsequently reflected within the outcomes of the interviews with professionals. Johnson indicated “if it’s going to happen in a very short timescale, it has to be something which is going to grab their [the audience’s] attention fairly immediately”, Chen (M.X): “let them [the audience] see the artwork; that is the most important thing” these bring up the notion of Incentive. Graham asserted that “in public places you have to be absolutely clear about different levels of audiences’ experience and how to get them involved”, Ji: “it has to be able to ‘tackle’ your consciousness”. These ideas match Accessibility while touching on features of Incentive. Chen (Z.H), Gillman and Graham claimed that increasing levels of variation and the dynamics of artworks can be a viable strategy for enhancing engagement with participants, which echoes the concept of Challenge.

Transfer is considered both a natural and essential quality of interactive art, according to Chen (Z.H): “if it [the interactive artwork] does not work the way it should, it cannot deliver its meaning”. At the same time it is also a key characteristic that functions to reveal the narratives of the artwork. Gillman pointed out that “meaning is not activated until somebody engages with it and receives that meaning”. Regarding the characteristic Play, Johnson stated that “All interactive works engage people at different levels, so that there are elements of play which come into the process”. This suggests that the form of the interaction with the interactive artworks is often embodied as a form of Play. The dialogues were consistently and meticulously restrained and directed to the context of the MRT and non-art public spaces, which informed the speciality of the Analytical Framework in its uses of examining the interactivity taking place within the proposed research context.

Phase of Refining the Analytical Framework

The forms of the five engaging characteristics were entirely manifested and discerned in the second research phase. This allowed integration and formulation of the Analytical Framework for analysis of interactive experiences. The framework was subsequently applied to examine the third research artwork (*We are One Family*). The objective of this research phase was, as in previous case studies, to investigate different features of interactivity and to analyse the factors that may strengthen or weaken any of the five characteristics. In the meantime, attention was paid to uncovering other potential characteristics that may influence the development of meaningful experiences. The presentation of the artwork (*We are One Family*) effectively attracted the attention of the passengers while also evoking various associations related to the art context (e.g. a harmonious family and the image of Taiwan).This displayed the features of both Incentive and Accessibility. Indeed, it was explicitly clear during the field study at the station that Transfer was the key characteristic in initiating playful interactivity, and in embodying the theme of the artwork. The characteristic of Challenge was also relatively evident vis-à-vis the previous two case studies. The explorative and experimental phenomena were clearly displayed.

Other than the physical form of the artwork and the interactive mechanisms, the setting in which the art was presented was found to be one of the major factors that influenced elicitation of diverse interactivities. In comparison, as has been previously discussed, the two art pieces *Time-Splinter* (see Appendix i, Figures 11 and 12) displayed in the exhibition halls in Yongning station were found to be struggling to attract passengers. Conversely, the artwork *We are One Family* is displayed alongside a passenger thoroughfare and easily engages the participants. This reiterates the importance of arousing a spontaneous engagement in such public spaces.

The interviews with the three artists were carried out in the final phase of this research. The objective was to obtain their creative intention for their artworks exhibited in the MRT stations, so as to examine the discrepancies between their preconceptions and the participant's

experiences. Since all three artworks have been exhibited in the spaces for several years, the artists seemed generally aware of the strengths and weaknesses of their creations in arousing interactivity. In addition, because of their professional status the outcomes from the interviews also brought fruitful references to underpin the practicality of the Analytical Framework. For example, E-Chen states, “The fact that the audience can immediately catch the responses produced by the artworks is very important”, which features Incentive. Hsiao argues that without physical interaction his artwork cannot be realised, this obviously features Transfer. Both Hsiao and Chiang asserted that by sharing the power of the transformation (Transfer) with the participant, their purposes were not merely to urge physical participation, but also to serve a higher purpose of prompting meaningful experiences. This brought out the notion of Accessibility. Interestingly, though playful interactivity was often discerned during field studies, the artists tended not to explicate this phenomenon as Play.

E-Chen alleged that he never thought about crafting ‘a good play’ because his intention was not to make a game but an artwork. Chiang was relatively objective on this aspect: for him play can be useful in prompting further interactivity; however, this cannot be at the expense of artistic value. Likewise, though Challenge was deemed a feasible tactic which could prolong engagement with the participants, as indicated in literature reviews, in interviews with the professionals, and by the features identified during the study of the artworks, the artists did not specify this characteristic. Hsiao and Chiang suggested that the nature of the MRT space may not be suitable for imposing too much Challenge; instead, their major concern was with experiences or resonances that can be elicited within a very short time scale. This implies that an immersive state and engagement may not be a condition pursued by artists presenting artworks in the MRT space. Nevertheless, it is undeniable that all three artists were concerned about whether and how artistic intents can be successfully delivered: all offering an abundance of constructive insight that substantially refined and further informed the Analytical Framework.

10.3 Summary

The research aimed to explore the concept of meaningful experience through repeated examination of both conceptual and physical interactive experiences within various research phases. The five engaging characteristics were separately identified and evolved into a more comprehensive Analytical Framework for the study of the interactive experience. The outcomes of the research demonstrate the significance of the five engaging characteristics (Incentive, Transfer, Accessibility, Play and Challenge) in arousing meaningful and fulfilling experiences and articulating how these approaches can be employed by art practitioners in their creations intended for display in public contexts similar to the MRT. In addition, the methods developed in this research provide crucial references for future researchers who intend to conduct research in similar public contexts. It was the objective of this research to develop practical methodologies and a research framework that can be utilised by artists and art researchers in the pursuit of more meaningful experiences in art-interaction.

Although the Analytical Framework has been carefully formulated and undergone repeated examination, thanks to the burgeoning, constantly expanding nature of this art genre this area of research has great potential to be developed. In order to obtain more diverse data on how meaningful experiences can be evoked through engaging with computer-based interactive arts, and to further strengthen the usability of the Analytical Framework in investigating interactive experience, potential dimensions of further studies have been suggested and discussed in the sections below.

Three Engaging Stages: Sensory, Physical and Cognitive

Holmes (Ascott 2000 p.90) remarks:

> The interactive art experience is one that blends together two individualized narratives. The first is the story of mastering the interface and the second is about uncovering the content that the artist brings to the work.

Taking Holmes's argument as a reference, meaningful experience can only be realised if the interface is mastered and the content uncovered. However, in order to achieve such a goal, a dedicated contextual research and creative strategy is required. Artists plan the theme to allow and prompt derivation of individual experiences through the course of the interactivity, upon which the interpretation of authorship is shared. Thus a certain degree of freedom is retained for the participant in their artistic encounters. The meaning of the experience is not given by the artist, but is navigated and develops within the artistic context set by the artist. It is necessary to emphasise that although the freedom of transformation and the active principle are the keys to permitting control and manipulation of the course of interactivity, an arbitrary, random development of consciousness or barely physical involvement may not constitute the state of engagement that was presupposed by the artist. According to Chiang and Johnson, a well-planned artwork would not allow the participants' associations to develop to in a vacuum or lead to nowhere.

The five engaging characteristics (Incentive, Transfer, Accessibility, Play and Challenge) were devised with the intention of constructing meaningful encounters. They function as a unified whole (the Analytical Framework) which works to gauge states of engagement in presentations of interactive artworks. The manifestation of each characteristic varies in relation to different presentations of artworks. The intensity of each characteristic is not always a positive attribute and often prompts deliberation over the context in which the works are exhibited. The intensity

of the characteristics therefore has to be adequately orchestrated within the creative process. In this research, the sequence of interactive experiences usually occurred in three stages.

Incentive (**Sensory Stage**) (first mentioned in p.109) is deemed a fundamental characteristic which serves to transport the audience into an interactive environment. At this initial stage, it is not necessary to elicit aesthetic or meaningful encounters; instead experience normally lingers on the sensory level. What is crucial is that the artwork should be capable of arousing the audience's attention in a positive manner, and that clues are given to allow the participant to wield the power of transformation.

Transfer (**Physical Stage**) (first mentioned in p.109), a natural quality of this art form, is the characteristic that establishes a reinterpretation of authorship. Transfer allows both the unfolding of narratives and the embodying of the work of art through physical involvement and manipulation. Through the course of interactivity, opportunities are given either to single or multiple participants, allowing them to discern the indicators of where and how they can enter the art contexts.

Accessibility (**Cognitive Stage**) (first mentioned in p.109) is the characteristic that bridges physical involvement and mental reflections. This reflection often consists of elements of familiarity which are able to facilitate the participants' development of meaningful experience or apprehension of the connotations of the art theme. In terms of physical manipulation and psychological association, a certain level of freedom is bestowed in the art form. However, this is by no means done in an arbitrary manner.

An integrated stage of interactivity or engagement can be reached when three essential engaging characteristics (Incentive, Transfer and Accessibility) are present. Perhaps due to the 'active

role' (Huhtamo 2004) Play often appears together with Transfer. Yet Transfer functions by encouraging participants to stand close and urges them to further engage with the artwork. Similarly, Challenge is inseparable from the other characteristics, and often accompanies both Play and Accessibility. Challenge acts to prolong and intensify engagement by the participant. It is understandable that with adequate Challenge the participants are tempted to participate and experience the artwork themselves. Although artists may not deem Play and Challenge to be as crucial as the previous three characteristics, they were frequently identified within the studies of the interactive artworks and were considered functional characteristics by the professional groups consulted and in relevant literature. For instance, as has been noted in the previous chapter, both Csikszentmihalyi and Graham believe that by increasing complexity, engagement can be sustained and augmented. Additionally, with the appropriate choreography of the interaction, the artwork will be able to modulate challenge. This can be seen in: *We are One Family*, *Piano Staircase* (Volkswagen 2009) and perhaps *Poetry on the Move*, as these artworks are concurrently capable of holding the participants' curiosity and urging them to explore the art installations or express themselves through the artworks. Accordingly, the findings suggest that both Play and Challenge have the capacity to exert certain levels of influence in arousing meaningful interactivity, although they often appear along with other characteristics.

Strictly speaking, the boundaries between the five characteristics are not always clear; to some extent, they overlap. This phenomenon appears in Pepperell's (Ascott 2000 p.14) arguments: "on close examination, the boundaries are always fuzzy" and "no things exist as separate things in themselves". Nonetheless, each characteristic has its own distinct, pre-defined features (see Glossary, pp.xiv-xv), which could assist future researchers in utilising them. Through extensive examination, it is evident that meaningful experiences cannot be produced with a single characteristic. The former three characteristics (Incentive, Play, and Accessibility) are recognised to be essential and the following two (Play and Challenge) also serve an influential

role in crafting a meaningful interactivity and engagement. Thus, it can be concluded that a combination of the five characteristics is instrumental in achieving the goal of engendering a meaningful art-interaction.

Recommendations of Further Studies

The results of this research propose a contextual analytical framework for the examination of interactive experiences, as well as a methodological strategy for data collection. These have been employed to explore and deepen understanding of experiences of actual encounters within the proposed research setting. The insights from members of the MRT artwork selection committee, the views of three professionals in the field, and the preconceptions from the artists who are the authors of the three artworks were also acquired and analysed. The outcomes of this research were derived by examining the context and experiences of audiences of the three interactive artworks and contrasting them with the views and experiences of the three groups of research interviewees. This showed how the implementation of the analytical methods demonstrates the practicality of the five engaging characteristics in their functions of enhancing interactive experiences.

The execution of the research and the techniques for data collection provide an alternative tactic to existing methodologies and may prove useful for future research investigating interactive experiences. In contrast to research conducted in a laboratory setting, the number of variables in an open public context is often dynamic. Thus, in addition to maintaining rigorous research standards, the application of the method had to remain flexible in this research context. The methods were altered from their conventional applications to probe individual experience and obtain the perspectives of professional groups. For example, instead of asking the interviewees to complete the questionnaires they were required to speak about their experiences in response to the questions on a laminated questionnaire. Considering ethical issues and the viability of

implementing the interviews in MRT stations, interviewee consent was obtained prior to interview and the video-cue recall technique was replaced by a digital voice recorder. The practicality of the methodology has been extensively examined over the course of the research, and through the use of an amended methodology informative resources were uncovered. These adaptations allowed the methodology to achieve the following:

1) To better approach the research participants
2) To investigate the participants' interactive experiences
3) To identify specific interactive features and their function in eliciting meaningful experiences

It is anticipated that the methodological strategy adopted in this research will be able to offer alternative approaches, applicable to the implementation of studies of interactive experience in public contexts similar to the MRT. There is great potential for contributions to be made to the field by expanding this research experience. In order to further substantiate and more fully equip the Analytical Framework, three focal areas are suggested for consideration in future research.

1) Mapping more representative experience patterns: the research has established an Analytical Framework for the examination and study of interactive experience. However, it is still important to investigate more diverse interactive behavioural patterns in order to further inform the framework. This could be conducted through the study of either different types of interactive interfaces or similar interactive presentations exhibited in different public contexts. Additionally, by applying the Analytical Framework, a long term plan could be made to construct a database of interactive experiences. Such a database would likely provide diverse references to assist future art practitioners in crafting meaningful interactivity.
2) Uncovering potentially engaging characteristics: the five engaging characteristics have been recognised through their collaborative function in constructing meaningful

engagement. They provide indices for studies of interactivity. Nevertheless, there remains a continuous need to enrich and verify the usability of the Analytical Framework and to identify potential characteristics that may evoke meaningful experiences. For example a 'Resonance' (first mentioned in p.92), the ability of artworks to stick in the mind and demand contemplation, which is reflected in Dewey's statement that: (1997 p.27) "The *effect* of an experience is not borne on its face".

3) Applying the Analytical Framework to other research contexts: as this Analytical Framework was dedicated to the study of interactive experience it has the potential to evaluate interactive and aesthetic experiences in other public contexts. Combining other existing methods or altering the Analytical Framework to develop alternative investigative strategies would offer the art practitioner a wider range of possibilities to probe the interactive experience in their context. Furthermore the results of future studies could reveal strengths and weaknesses in each characteristic and may further strengthen the practicality of its application in the original research context

In summary, this final section recapitulates some of the significant and original contributions made by this research. These include: 1) the development of pertinent contextual methods to develop explorative insights into interactive experience, 2) the observation of instrumental features that may arouse meaningful interactivity and 3) suggestions for potential dimensions for further research development. The research discloses insight into linked practical interactive phenomena, and contrasts the findings with theoretical knowledge related to features which may inspire future interactive creations. Upon this basis, this research has also attempted to arouse an increased awareness of studies of interactive experiences that take place in wider non-art public spaces, in the hope of achieving the study's ultimate goal of enriching interactive experiences in encounters with interactive art.

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