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應用藝術研究所

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居家環境中照片的意義

The meaning of photos at home to family members



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### 摘 要

近年來數位影像科技大幅地進步，數位照片相關產品的功能變得越來越強大，價格也越來越便宜。因此，數位照片裝置的普及率以很快的速度上升，使得數位相機市場即將趨於飽和。為了找出潛在的數位照片相關產品未來發展方向，使用者的照片使用經驗成為數位照片相關產業在創新需求時的關鍵議題。

從傳統照片到數位照片，照片的形式改變了，數位照片比傳統照片更容易儲存也更容易分享。拍照漸漸變成一個日常活動，人們時常透過照片與親友分享生活經驗與情緒。這表示不僅是照片的形式有所改變，照片對於使用者的意義也有了不同。照片不再只是紀錄特定事件的媒體，而在人們的情感溝通上扮演了重要的角色。

本研究以家庭為主要的研究場域，採用脈絡訪查法(Contextual Inquiry)探查家庭脈絡下的日常照片使用經驗，經由在受訪者家中進行實地的訪談與觀察來了解照片與家庭成員的關係，家庭中的照片使用行為，與數位影像科技對家中照片使用行為的影響。根據對人們的照片使用行為與人們對家中傳統照片與數位照片的態度的探索，本研究歸納出七種照片在家庭中現有的使用上的意義，包括紀錄個人或家庭的歷史、保存記憶、代表所愛的人、分享經驗、展示成就、藝術創作與發展社交關係。此外研究中對實體照片與數位照片間差異的理解，也說明了不同世代間因為對數位科技接受程度不同而產生的照片分享斷層，與資訊產品因對家庭生活造成負擔而難以進入家庭的現象。相信本研究對家庭中照片使用經驗的探討，與依據研究結果所提出的未來數位照片科技應用發展方向，將讓未來的數位照片相關產品或服務更能符合使用者生活中的需求。

# The meaning of photos at home to family members

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## ABSTRACT

In the last few years, digital photo technologies have had a great improvement. Digital photo applications have become more powerful and cheaper than ever. It is also true that digital photo devices are getting popular. With the growing popularity, however, the digital camera market is near saturation. In order to find out new directions for potential digital photo applications, to uncover users' needs on photo usages has become the key issue in the digital photo industry.

This study explores relationships between family members and photos, features of home photo usages, and influences of digital photo technology on home photo usages through Contextual Inquiries. In-field interviews and observations on informant families' daily photo usages and attitudes toward photos at home are conducted.

Through the in-field studies, understandings about the present usage and attitude of people toward both conventional and digital photos in the family are revealed. According to these findings, seven different meanings of photos at home to family members are identified, including creating personal or family histories, preserving memories, substituting for one's love, sharing experiences, manifesting achievements, creating artwork, and developing social relationships. Besides, the differences between printed photos and digital photos in these uses help us explain the big gulf of photo sharing between generations and the difficulties for adopting computing technology at home. Based on the knowledge above, new directions for the applications of future digital photo technologies that actually fit in with users' needs are pointed out.

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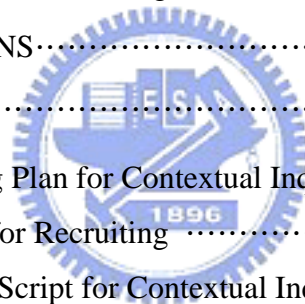
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# 1 INTRODUCTION

As digital photo technologies have advanced rapidly in recent years, digital photo applications have become more powerful and affordable, and thus popular. However, with the fast-growing popularity, the digital camera market is near saturation. A survey from Camera & Imaging Products Association (CIPA) [1] shows the annual global market growth rate for digital camera has dropped from 70% in 2004 to less than 30% in 2005. At the same time, digital multimedia devices and internet services also begin to enter the domestic sphere. With these digital devices, images taken with the digital camera can be stored, browsed and shared. However, it remains problematic whether these digital devices meet the user's requirements for using photos at home. In order to find new directions for future digital photo applications, uncovering the users' needs on "*photo usage*" become the key for digital photo industry. By "*photo usage*" in this research, it means a set of activities consisting of the technologies, photos, the photos as symbols, and the social aspects of photo circulation.

## 1.1 Current Trend of Digital Photo Devices

Digital photo devices have gained popularity in recent years. According to a survey published in 2005 by Market Intelligence Center (MIC), 44% of households in North America and 58% of households in Japan had digital cameras [2]. At the same time, the market share of camera phones over the whole cellular phone sales has risen from 30% in the first half of 2005 to 60% in the second half of 2005 [3]. The popularity of digital photo-related devices brings about a large number of digital photos of people's daily life.

From traditional analog photography to digital, not only the form of photo has changed, but the way people use photos and their attitude toward photo-taking activity have changed as well. Digital photos can be distributed through the Internet. In 2006, 65% of households in Taiwan use broadband Internet connections. [4] With the popularity of broadband Internet, digital photo sharing becomes an everyday activity. The online photo albums, which help people share their digital photos with friends on the Internet, are well accepted by the Internet users. One of the well-known online photo albums, flickr, has already cumulated 25 million

members [5]; and WRETCH, a popular Taiwan blog hosting site known for its album service, has reached 18 million members [6]. These records show that people have the desire to share their photos with others. With 3G camera phones and wireless digital cameras, digital photos can be shared easily and instantly with remote friends or family. There are already numerous tools and services in the market for taking and sharing digital images.

To expand the market of photo-related product, Philips has released *Digital Photo Display* for showing photos at home and Nokia has introduced *Imagewear*, a tiny wearable photo display. HP and Kodak both invested in exploring users' capturing, browsing, sharing and printing activities. Digital photo application has already become a popular domain in the consumer product market.

## **1-2 Digital Home**

Recently, "Digital Home" has become a very popular domain in the information technology market. Several information technology companies including Intel and Microsoft are pushing information devices and services into domestic sphere. Except continuing promoting Personal Computers (PCs), they try to bring consumer electronic products and wireless network into people's homes. Their common ambition is transferring PCs into the center of digital multimedia entertainment devices at home. Meanwhile, consumers are getting more interested in digital multimedia devices which upgrade audio and video entertainment experience and home electric appliances which facilitate communication at home. There is great potential for expanding the market of "Digital Home".

As more and more digital media devices such as Digital Television, DVD Player/Recorder, and Personal Video Recorder enter domestic sphere, consumers produce and keep more and more digital audio/video contents. These digital contents are produced in different format with different devices and stored in different devices at home, thus each of them is usually watched or listened to only on a specific device. For example, digital photos stored in the computer could only be browsed on the computer screen, and TV programs recorded with the Personal Video Recorder could only be watched in the living room. Therefore, people in the

information technology business are aim at connecting all of the digital devices at home with in-home wireless network to support users watching or listening to any digital content at anywhere in their home without restricting by any specific digital media device. For instance, with in-home wireless network connecting computers, TVs and speakers, digital multimedia content in the computer can be played in the living room, where people used to spending their leisure time. Viewing digital photos with TV and listening to digital music downloaded in the computer with speakers in the living room are no longer an unreachable dream.

In 2004, more than a hundred companies in the information technology and consumer electronic device market announced their foundation of Digital Living Network Alliance (DLNA). [7] The goal of DLNA is establishing an interoperability framework between digital devices in the domestic sphere that facilitates shifting of digital multimedia contents between consumer electric devices and PCs and helps users share and exchange their digital contents with digital devices that connected to in-home wireless network. The integration of technologies builds a platform for the exchange of digital content at home, but development of digital media appliance that fits for the domestic sphere has just started. Presently, digital photos at home are usually browsed and shared with present devices such as computers and TVs, however, whether these devices meet users' needs for applications of digital photos at home and whether digital photos can be applied in different ways in different contexts are still discussible issues. These issues are discussed in the following chapters.

### **1-3 Motivation**

From conventional to digital media, the form of photo is changing. Digital photos are stored and shared in an easier way. Therefore, it has been getting more obvious that taking photos is becoming a daily activity and that people share their experiences and emotions with their family members and friends through photos. These behaviors have indicated that the meaning of photos to users is changing. Photos have not just been media for recording certain events, especially at home, but played an important role in the emotional communication between family members through mutual memory keeping and daily life experience sharing. Therefore, "home" is taken as the research field to explore users' existing experience of daily

life *photo usage*. Through discovering the meaning of photos to families, it is possible to point out directions for the applications of future digital photo technologies.

#### **1.4 Objective**

This research aims to explore the *photo usage* experience among the family members. One of the objectives is to understand family members' photo-related behaviors that take place at home in their daily life, such as taking, managing, browsing, sharing and displaying photos. In addition, this study is intent to reveal the important characteristics of *photo usage* experiences, including the relationships between family members and photos, the features of home *photo usage*, and the influences of digital photo technology on home *photo usage*. To ground all the research findings to a vivid conclusion, this study also plans to establish the meaning of photos at home to family members, and point out the directions for how the future digital photo technologies may further enhance people's *photo usage* experience at home.

#### **1.5 Scope**

The major field of this research is “home” setting. Usage of both conventional and digital photo at home in daily life is discussed while commercial *photo usage* such as commercial photography and using photos for commercial information exchange is not the major concern. Besides, to highlight the photo-related interaction between family members, this research focus on photos shared by family members instead of private personal photos. However, these photos are not necessarily family photos taken at home; as long as they are shared by family members, they are concerned in this research. In addition, professional photography techniques are not the focus in this research; the emphasis is put on users' behaviors, motivations, and expectations.

#### **1.6 Significance**

On the trend of “Digital Home”, digital devices in domestic sphere will certainly be the focus of future information technology product design. Meanwhile, information technology product designers and developers care more about providing pleasant experiences for users these days. Thus, designers of future photo-related domestic appliances should explore

present user experiences and consider phenomena and problems about the uses of current photo-related appliances. Through this research, understandings of current usages and attitudes of people toward photos at their home are revealed. The influences of digital technology on the usages and attitudes of people toward photos are also discussed. Furthermore, a systematic knowledge about the relationship between families and photos at home is generalized, which will inspire designers the design of future home photo devices and services that fit in with people's life better.

### **1.7 Outline of Thesis**

This thesis consists of seven chapters: The research background, motivation, objective, scope, significance, and outline of this thesis are introduced in Chapter One. Several relevant studies of photos and meanings of objects are reviewed in Chapter Two. The method of data collecting and analyzing in this research are described in Chapter Three. Findings summed up from field data are presented in Chapter Four. Insights in terms of the meaning of photos in domestic sphere and key factors about how digital media influence *photo usage* at home are summarized in Chapter Five. The implications for future device and service design of *photo usage* are delivered in Chapter Six. At last, the conclusion of this thesis is in Chapter Seven.

## 2 LITERATURE REVIEW

The purpose of this chapter is to consider present understandings of users' photo experience, and the meaning of photos to people, especially at home. In order to facilitate discussion about the direction of the following studies, prior researches about *photo usage* and the meaning of objects are reviewed in this chapter.

### 2.1 Photo-related Research

To reach preliminary understandings on users' present photo experience, gaining considerable issues, and form the structure of this research, the methods and findings of prior researches about conventional and digital *photo usage* and the meaning of photos from social sciences, design, and information technology points of view, and the development of digital photo-related appliance prototypes are discussed as follows.

#### 2.1.1 Photo-based Research

Researchers in the social sciences such as anthropologists, psychologists and educators use photos to elicit memories and stories from people. The researches mentioned below discuss how researchers understand people's life through photos.

Chalfen, R. [8] conducted structured interviews and unstructured discussions with teenagers to evaluate the relative merits of using still photography and videography as a preferred medium of family photography. He indicates that family photography is frequently associated with memory and general issues connected to recall of the past. He uses the metaphor of making a memory bank to describe taking photos. This metaphor is telling that a bank is locked up, it prevents loss, it preserves value, and in a sense, it disallows change. Besides, interest grows with investment of picture taking energy, and values increase with time. In other words, photos provide stability and permanency for one's personal and family knowledge of the past.

The relationship between photos and time, and the link between family photography and

personal/family knowledge are also discussed by Cronin, Ó. [9]. He reviewed theoretical and therapeutic literature on the meaning and psychological significance of family photos. A series of assumptions underpinning the use of photos in research and clinical contexts was evaluated. One of the assumptions is that the essence of a photograph, which differentiates it from other forms of representation, is its relationship to time. He mentions that Boerdam and Martinius believe that photos are a protection against time. They argue that photography has the function of helping one to overcome the sorrow of the passing of time, either by providing a substitute for what time has destroyed or by making up for the failures of memory. Cronin, Ó also evaluated another two assumptions which are that family photographs can either tell us something about family dynamics, or can convey an impression of family unity and cohesiveness; and that family photographs are used to create personal histories. He indicated that therapists have used photos to explore family systems. From photos, phototherapists infer family dynamics, power relations and affectional bonds. He also quoted Sontag's claim that photos came along to memorialize, to restate symbolically, the "imperiled continuity and vanishing extendedness of family life". Besides, the rest of his assumptions are: that there are two types of photograph, those which contain information and those provoke an emotional reaction; that the use of photographs tends to be grounded within either a 'realist' or a 'symbolist' folk myth; that the meaning of a photograph arises in a narrative context.

Loeffler, T.A. [10] had also discussed about the issue that the meaning of a photo arises in a narrative context through her research which used photo-elicitation interviews to investigate the significance of university-based outdoor experiences for participants. She ascertains the role of photography in assisting students to make connections from their outdoor experiences to their everyday life. Photos are proved to be a powerful reflective tool that participants utilized as anchors and triggers for past memories. They used photographs to capture meaningful moments from their outdoor experiences and then used the photos to share their experiences more easily with family and friends. This research contributes to the ways in which photography facilitates participants' connections to those experiences.

These studies generalized several meanings of photos to people, such as containing



information, connecting to experiences, and provoking emotional reactions, which are referable for understanding the meaning of photos to families. However, their theses gave little description about people's daily *photo usage* such as capturing, managing, and sharing. The impact of digital technology on the meaning of photos is not included in these researches, too. Therefore, it is hard to gain direct information for developing home digital photo devices and services from these studies.

### **2.1.2 Photo Usage**

In the studies summarized below, researchers covered the impact of digital technology to review people's *photo usage* and show some different implications between printed photos and digital photos.

Mäkelä, A. et al. [11] conducted a field trial case study of leisure related communication with digital photos. Their three major findings about the usage of photos are: first, photos were mainly used for joking, expressing emotions and creating art; second, users' perception of photos changed from memory support to the expression of current activities and feelings; and third, photos were not enough for functional communication, therefore possibility for annotation with text or audio should be provided.

Frohlich et al. [12] studied eleven families by using a combination of ethnographic field observations, interviews, and self-recording techniques to investigate peoples' sharing practices of conventional and digital photos and to find out what people want to do differently with digital photos. They classified the way people share their photos into four categories along two dimensions, here versus there, and now versus later. In the category, "Archiving", it shows that photos can be exchanged asynchronously between people by accessing photo albums in a fixed location. Photo albums are seen as the best way of archiving conventional photos for future sharing. But it is hard for families to making up albums while lacking the time and motivation to do so. In "Sending", it shows that photos can be exchanged asynchronously by mailing or e-mailing photos to others in a remote location. Photo-sending activities are embedded in ongoing interactions and relationships. Families experience joy

from the feedback and subsequent conversation around the photos they have sent. In “Remote sharing”, it shows that photos can be exchanged synchronously between people separated by distance. Many participants said that they frequently send and receive photos to or from remote locations, and then discuss those photos synchronously over the telephone. In “Co-present sharing”, it shows that photos can be exchanged in real time between people co-located in time and place. Of all the methods of interacting around photos, sharing photos in person was described as the most common and enjoyable. In contrast, many participants reported being “turned off” by looking at digital photos on a computer screen when sharing with friends and family.

Frohlich et al. have found that photos are taken ostensibly to capture memories for future personal reference, but in practice are used to review and communicate experiences with others. In general the most successful past and present photo-related technologies have been those with the greatest affordances for image-based communication. They believe people would like to use photos more extensively as catalysts for conversation in extended family and friendship contexts, and to improve individual relationships over distance and time. Future technology should help users in their socialization of digital photography products and services, in order to extending the sharability of digital photos cross a range of use contexts.

Interviewing 13 people about their current practices of taking, sharing, annotating, retrieving, and using photos, and conducting two focus groups, Van House et al. [13] identified three social uses of personal photography: memory, creating and maintaining relationships, and self-expression. They indicated that photos have an ability to evoke memories, including sensual memories. People's attitudes toward photo annotation are conjectured to be associated with issues of memory. Photos are used to maintain existing relationships and even create new ones, too. The strong presence of family and friends in people's photos high-lights the importance of interpersonal relationships and photos. Besides, photos are also used as self-expression, which give expression to our authentic self. In addition, Van House et al. had also discussed about people's attachment to printed images and resistance to recording metadata in their research. They explained these phenomena with the

roles of orality, materiality and storytelling in *photo usage*: first, the materiality of prints interacts with the social uses of photos and the practices of creating photo albums and face-to-face photo sharing; second, the role of face-to-face oral communication in people's use of photos is associated with their overall lack of interest in assigning metadata and making annotations; and third, printed photos support the oral transmission of family stories and intergenerational experience and knowledge.

Voida, A. & Mynatt, E.D. [14] developed an instant messaging client as a technology probe to explore the use of digital photographs in computer-mediated communication. Six themes of the communicative appropriation of photographic images emerged from their analysis: the image as amplification, the image as narrative, the image as awareness, the image as local expression, the image as invitation, and the image as object/instrument.

These studies above gave detailed description about people's daily *photo usage* and the impact of digital technology on their *photo usage*, which directly inspire the development of digital photo devices and services and are helpful for this research. Besides, the research methods of field study in these studies for obtaining users' behavior and attitude are also referable for this research.

### **2.1.3 Digital Photo-related Prototype Systems**

For designing digital photo devices and services at home, it is necessary to be acquainted with the latest digital technologies supporting *photo usage*. The researches motioned below are about prototype systems developed based on current technology for managing, browsing, and sharing personal photo collections by researchers of information technology and design.

Graham, A. et al. [15] developed two photo browsers for collections with thousands of time-stamped digital images. Their browsers exploit the timing information to structure the collections and to automatically generate meaningful summaries. The browsers differ in how users navigate and view the structured collections. They conducted user studies to compare the two browsers and an un-summarized image browser. The results showed that exploiting

the time dimension and appropriately summarizing collections can lead to significant improvements. For example, their browsers enabled improvement in speed of finding given images compared to the commercial browser.

Wenyin, L. et al. [16] present a novel approach to semi-automatically and progressively annotate images with keywords. When the user submits a keyword query and then provides relevance feedback, the search keywords are automatically added to the images that receive positive feedback and can then facilitate keyword-based image retrieval in the future. The coverage and quality of image annotation in such a database system is improved progressively as the cycle of search and feedback increases. The strategy of semi-automatic image annotation is better than manual annotation in terms of efficiency and better than automatic annotation in terms of accuracy.

Photos play a central role in many types of informal storytelling. Balabanović, M. et al. [17] developed an easy-to-use device that enables digital photos to be used in a manner similar to print photos for sharing personal stories. A portable form factor combined with a novel interface supports local sharing like a conventional photo album as well as recording of stories that can be sent to distant friends and relatives. User tests validated the design and revealed that people alternate between "photo-driven" and "story-driven" strategies when telling stories about their photos.

Sarvas, R. et al. [18] implemented a mobile phone photo sharing system "MobShare" that enables immediate, controlled, and organized sharing of mobile photos. The design combines research on photography, personal photo management, mobile phone camera use, mobile photo publishing, and an interview study they conducted on mobile phone camera users. The implementation describes solutions in immediate sharing of mobile photos to an organized web album, and in providing full control over with whom the images are shared.

These researches introduced the innovative features of photo-related prototype systems, how their functions worked, and the positive effect in using these systems. This information is

helpful for the design of future photo devices and services which properly apply digital technologies.

## 2.2 Meaning of Objects

Photos are often regarded as meaningful objects in domestic environment. In order to facilitate discussion about the meaning of photos at home, studies of the meanings of objects in domestic environment are reviewed.

Richins [19] divided meanings into private and public. The sources of meaning are in Utilitarian value, Enjoyment, Representations of interpersonal ties, and Identity and Self-Expression. This relatively similar categorization leaves out the ‘companion’ category, and proposes enjoyment as a separate one. Her paper also presents a thorough analysis of approaches to product meaning and value.

Battarbee, K., and Mattelmäki, T. [20] analyzed 113 stories about meaningful products collected in Finland and divided three main categories of meaningful relationships with products: meaningful tool, meaningful association, and living object. If a tool is needed for a purpose, in which the activity itself, not the hardware, it is sorted in the category of "Meaningful Tool", such as a foldable hair brush, a mobile phone, and a sewing machine. If a product refers to or carries a meaning given by culture or an individual, it is sorted in the category of "Meaningful Association", such as a Pastilli chair and a wedding ring. If there is an emotional bond created between the person and the individual product, the product is sorted in the category of "Living Object", such as a toy car and a stuffed toy bunny. Battarbee and Mattelmäki also mentioned that people have many overlapping relationship to meaningful objects at the same time.

In "The meaning of things –Domestic symbols and the self", Csikszentmihalyi & Rochberg-Halton [21] studied the significance of material possessions in contemporary urban life, and of the ways people carve meaning out of their domestic environment. They interviewed 82 families in Chicago about things that are special for the family members and

the reasons of why those things are special. The “significations” of the special things were coded into 37 categories of meaning. Of all the reasons given for cherishing photos, Memories and Immediate Family had the largest proportion while no other object had such a high proportion of reasons in these two categories. Photos serve the purpose of preserving the memory of one's close relations more than any other object at home. Photos which bear the image of a departed kin impart a tenuous immortality to beloved persons and provide an identity, a context of belongingness, to one's descendants. In addition, Csikszentmihalyi & Rochberg-Halton mentioned that the preference for photos shows a dramatic age difference. Photos meant the most to grandparents and the least to children. Ten percent of the children mention at least on photo as being special, as compared to 22 percent of the parents and 37 percent of the grandparents.

Bih [22] investigated the role that objects have in helping people adapt to a new environment. Fourteen Chinese postgraduate students going abroad were interviewed one semester after their arrival in New York City. The meanings that students attached to objects, and how the meanings of objects changed during their adaptation to their new environment are discussed. The discussion is placed in the context of person-object relationships and it is emphasized that objects can both reflect and actively affect an individual's feelings and emotion. Many of the students brought their photos to the new environment with them. One student brought the photos of his parents to encourage him. Two students brought their girl friend's photos that let them feel that their girl friends were still close to them. One student looked at the photos of 'the good old days' when she was in bad mood. One student brought an album of his travel pictures taken in 15 different countries. He said that it was very helpful for the development of social relations. Photos were brought to the new environment to connect with their past experience, present conditions, and future expectations.

Different from the researches mentioned above emphasized on description and categorization of meaning of objects, Bih focuses on the change in the relationship between human and objects. He indicates that meanings exist in a context of specific personal history and environment, meanings are the results of human-object interaction, meanings are not static,

how meanings change in different contexts and how people attach meanings to objects is discussible. Likewise, in this research, the meaning of photos in the context of the interaction between family members and the changes of the meaning of photos as family life changes are discussible and would be discussed in the following chapters.

These studies above did detailed analysis of the meanings of objects in people's residence from psychological views. Some of them provided insights into the meaning of photos. The connections between photos and memory, family, achievement, and social exchange are revealed in these researches. Besides, the methods of obtaining the meaning of objects from the users in these studies are also referable. However, their studies did not cover digital photos, so the differences between the meaning of printed photos and digital photos are absent.

### **2.3 Summary**

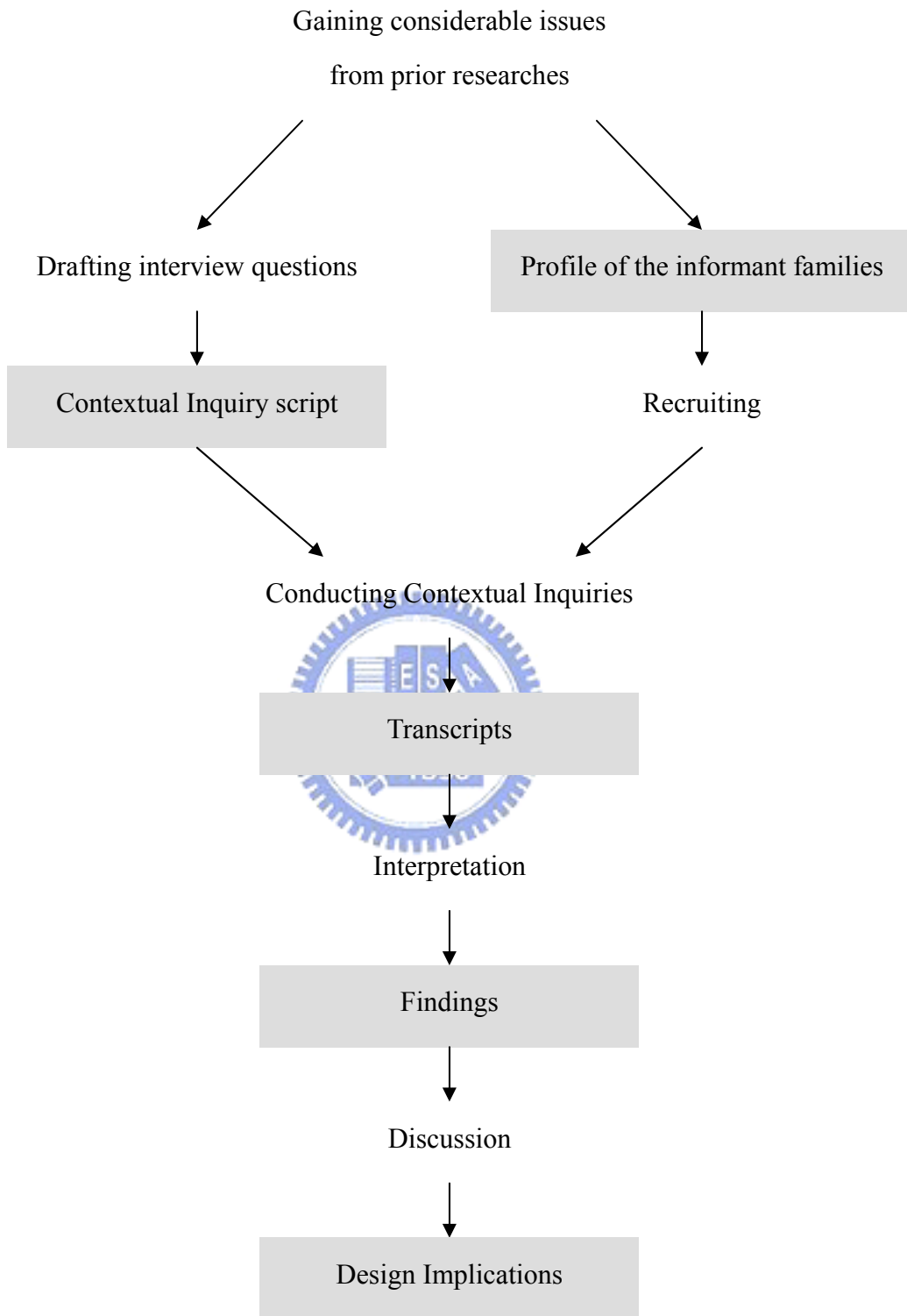
These studies reviewed above provide different points of view to review *photo usage* in different contexts and show the diversifications of *photo usage*. However, the study of covering both the meaning of conventional and digital photo and photo-related devices uses at home for individual and family is absent. This thesis aims at uncovering the detail of how people interact with photos at home based on Contextual Inquires discussed in next chapter. Furthermore, some design implications derived from findings are also discussed in Chapter Four to Chapter Six.

### 3 METHOD

To fully acquire users' experience about *photo usage* at home, understanding of users' behavior and value is critical and indispensable. However, this kind of information cannot easily be learned through traditional research methods such as questionnaires. Thus, instead of collecting a large number of data through survey, a user research method called "Contextual Inquiry" that helps researchers enter the context of users' daily life and acquire knowledge about user's experience through interviews and observations about users' activities is conducted to collect data about daily *photo usage* at home.

The research method in this research includes collecting data through Contextual Inquiry, analyzing data in a qualitative way, and proposing implications for future photo device and service design. First, considerable issues were acquired from prior researches and transferred to interview questions. Second, the Contextual Inquiry script was planned and profile of the informant families that describes the characteristic of the informant families and their photo experience was formed. Third, informant families were recruited and Contextual Inquiry was conducted. The Contextual Inquiry script was improved between each inquiry. Fourth, the inquiries were taped and transferred into transcripts, which were coded into key ideas and interpreted into several themes. Finally, features of how people capture, manage, browse, share, and display photos and their attitudes toward photos at home were presented and the implications for future digital photo device and service design are delivered. (See Figure 1)





**Figure 1 Research structure of this thesis**

### 3.1 Contextual Inquiry

According to Hugh Beyer and Karen Holtzblatt's [23] definition, Contextual Inquiry is a field data-gathering technique that studies a few carefully selected individuals in depth to arrive at a fuller understanding of the work practice across all customers. Through inquiry and interpretation, it reveals commonalities across a system's customer base.

Contextual Inquiry is originated from ethnography, which was originally a research method used in anthropology. In the Contextual Inquiries, researchers observe users' activities in the real environment they live in or work in to obtain information about the way they live or work. Contextual Inquiry differs from ethnography in that Contextual Inquiry researchers not only observe people's activities in the real context, but also conduct in-field interview with the users. During the interview, researchers and users discuss about users' activities, their motive of these activities, the problems they encounter, and the way they deal with the problems. The interview proceeds in an in-depth semi-structured way. There is a scheme for the interviewer, but no word-by-word questions to follow. The whole inquiry is a process for the researchers and users to explore users' activity collectively. Users respond researchers questions with self-experience; and researchers ask further questions from users' feedback. Through the process of Contextual Inquiry, researchers accumulate fuller understandings about the research issues, and keep asking further questions to be answered in the next inquiry. Unlike structured interview and questionnaire, the purpose of Contextual Inquiry is not to confirm the opinion of most users, but to explore users' work practice broadly.

To understand users' *photo usage* at home and uncover users' needs for photo-related domestic appliances, Contextual Inquiries that include in-field interviews and observations were conducted at the informant families' home. Through in-field interviews with users, firsthand information about people's photo-capture, storage, and sharing behavior and their attitude toward photos under real environment are revealed. Each interview lasted about two hours. The interviews were taped, and photos of their cameras and other photo-related devices, places they keep their photos, their label and annotation on their photo, the photos they displayed in their home and every photo they mentioned were also taken during the interview

for the researchers to analyze.

### **3.2 Recruiting Informants**

The key feature of Contextual Inquiry is obtaining information of issues concerned in this research through the participation of the users in the real environment. During the two-hour process, discussions with the informants and the representation of informants' activities help disclosing users' experiences. Representative users are recruited as informants in Contextual Inquiries to provide rich and firsthand information instead of a large number of respondents for quantitative survey.

Recruiting informants for this research was not easy. Most people hesitated to let strangers enter their home, especially when the strangers need to see their private photos. Therefore, the informants were mostly recruited from acquaintances of the researchers in this research. Thus, they were willing to have interviews at their home. Screeners were sent to each of the candidate informants. The screener is a questionnaire explains the purpose of this research and consists of a set of short questions, which reveals their photo-related behavior. (See Appendix B) It helps to filter out people who fit the criteria set for the contextual inquiry. The criteria for screening out the informants were the frequency of taking and sharing photos, the variations of using different photo taking devices such as conventional cameras, digital cameras, and camera phones, and the variations of media use for sharing photos such as flipping photo albums together, showing photos with photos frames in the public area, E-mailing their photos, and uploading their photos to the online photo albums. After filtering out informants who fit the criteria, they were asked for exact dates and times for the visit.

In order to explore the photo-related interaction between family members, a family was recruited as an informant unit. According to Kuniavsky's [25] suggestion, five to eight informants should give a pretty good idea of the target user and should be enough for the inquiry. Therefore eight families were preplanned to be interviewed in this research. However, the number of informant families is not confirmed until the information acquired from the latest informant family is similar to previous inquiries very much. After the acquired data

reached “Theoretical Saturation”, no new informant family is added. Finally, the contextual inquiries were conducted with nine families in north Taiwan, especially in Taipei and Hsinchu area. In order to gain understandings of *photo usage* in different family life stage, these families are picked of different composition, including young couples with preschool children, middle-aged couples with and without their children living at home. (See Table 1)

**Table 1 Profiles of informant families**

Family	Composition	Camera	Storage	Sharing
1	Middle-aged couple without their young children living at home	Traditional camera, Single-lens reflex camera, Digital Camera, Camera phone	Photo album, Photo frame, Wall, Computer, CD	Photo album, Photo frame, Computer, E-mail, Online album, Online space
2	Couple with their preschool children	Traditional camera, Single-lens reflex camera, Digital Camera, Camera phone	Photo album, Wall, Computer, CD	Photo album, Wall, Photo frame, Mail, Computer
3	Middle-aged mother with her young children	Traditional camera, Digital Camera	Photo album, Wall /Desk, Computer	Photo album, Computer, Online album, Online space
4	Couple with their preschool children	Traditional camera, Digital Camera, Camera phone	Photo album, Computer, CD	Photo album, Photo frame, Mail, Computer, E-mail

5	Middle-aged mother with her young children	Traditional camera, Digital Camera	Photo album, Wall /Desk, Computer, CD	Photo album, Computer, E-mail, Online album, Online space
6	Old-age couple with their children living at home	Single-lens reflex camera, Digital Camera	Photo album, Computer, CD	Photo album, Photo frame, Computer, E-mail, Online space
7	Old-age couple without their children living at home	Traditional camera, Digital Camera, Camera phone	Photo album, Photo frame, Computer, CD	Photo album, Computer, E-mail, Online album
8	Middle-aged couple with their teenage children	Traditional camera, Digital Camera, Camera phone	Photo album, Computer, CD	Photo album, E-mail
9	Middle-aged mother without her young children living at home	Traditional camera, Digital Camera	Photo album, Wall, Computer	Photo album, Photo frame, Wall, Mail

### 3.3 Research Questions

The in-depth inquiry was mainly focused on informants' photo-related activities, including taking, managing, browsing, sharing, and display, and their motivations. The difference between their attitude toward conventional and digital photos and their opinions about photo devices or services recently in the market were also discussed. Figure 2 shows the entire procedures carry out for each informant family. During the in-field interviews, the processes and unexpected findings of the interviews are noticed momentarily and the interview questions are added or subtracted according to the feature of the informant families.

(Before the interview) Asking informants for picking photos having specific meanings to them



Introduction of researchers, research objective and procedures



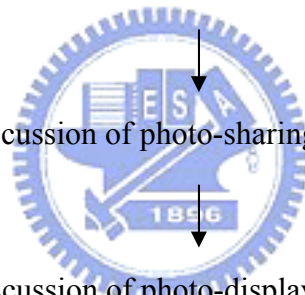
Discussion of photos picked by informants



Discussion of photo-taking activities and devices



Discussion of photo-managing activities



Discussion of photo-sharing activities



Discussion of photo-display activities



Discussion of informants' attitude toward conventional and digital photos



Introduction and discussion of latest photo devices



Discussion of other related issues and Acknowledgement

**Figure 2 Procedures of Contextual Inquiry in this research**

The purpose of this research is to understand the meaning of photos to family members. It is hard for some informants to express their opinions about the meaning of photos directly. Through browsing and talking about informants' photos, informants' attitude toward photos is revealed. Therefore before the interview, the informants were requested to pick five photos having specific meanings to them. The photos must be taken by the informant or his family and viewed by more than two members in his family for revealing the photo-related interaction between family members. The informants were requested to show and introduce the photos they picked. Some questions about these photos were asked, such as why these photos are special to them, under what circumstances they took these photos, with what device they took these photos, why they took photos with the specific device, and which aspect of their photo-taking devices they like and hate about and why.

Some questions about their photo managing, browsing, sharing, and display habits and their *photo usage* between conventional and digital photos as follows were also asked:

Where do you store your photos at home?

How do you manage your photos?

How do you name, label or annotate your photos?

Under what circumstances do you review your old photos?

Which photos do you share with others?

Whom do you share your photos with?

How and for what purpose do you share your photos?

How do your family members or friends share photos with you?

Which photos are displayed at the public area at home?

Where and why do you display these photos?

Do you carry photos with you?

Is there any difference between your conventional and digital *photo usage*?

Which aspects do you like and dislike about conventional and digital photography?

Do you have different attitude toward conventional and digital photos?

At the end of the interview, photo devices and services recently in the market were introduced to the informants, including instant camera, sticker camera, wireless digital camera, 3G camera phone, portable digital photo printer, online photo album, digital photo frame, and digital photo necklace. (See Table 2) These products include conventional and digital devices and services used for photo taking, managing, sharing, and display in the domestic sphere. In order to increase the informants' understanding to these products, pictures of these photo-related devices are displayed at the same time. The opinions about these products and the way they might want to use them were also asked and taped.

**Table 2 Photo devices introduced in Contextual Inquiry (for more details please refer to Appendix C)**

Photo Device	Brief Introduction
Instant Camera	After taking a photo with an instant camera, the camera will print a tangible photo immediately, and then you can see and share the photo on the instant.
Sticker Camera	The function of sticker camera is similar to an instant camera, except the printed photo is a cute sticker in a shape of bandage.
Wireless Digital Camera	The wireless digital camera is connected to the internet. You can transfer your photos from the camera to your computer or directly to your online photo albums.
3G Camera Phone	After taking photos with the 3G camera phone, you can transmit the photos to another 3G camera phone.
Portable Digital Photo Printer	With the portable digital photo printer, you can print photos by yourself. The portable digital photo printer has a grab handle for you to carry it everywhere. Besides, you can make your own photo sticker and magnet with this printer.
Online Photo Album	You can share your digital photo with family and friends or the public on the online photo album, and annotate the photos in an easier way.



Digital Photo Frame	You can load hundreds of your digital photos into the digital photo frame. The digital photos can be view as slideshow with the frame on your desk.
Digital Photo Necklace	You can load your favorite photos to this tiny wearable display, and wear your necklace with a unique pendant.

### 3.4 Analysis

After each inquiry process, a debriefing session is proceeded as soon as possible. Questions about informant families' taking, managing, and sharing activities, photo-related interactions between their family members, and differences between their attitude toward conventional and digital photos as follows are answered.

1. What is their 6W1H (who, what, when, where, why, how, whom) of photo taking?
2. What is their 5W1H (who, what, when, where, why, how) of photo management?
3. What is their 6W1H (who, what, when, where, why, how, whom) of photo sharing?
4. What is their motive of using specific device to take, manage or share their photo?

What are their needs for devices for taking, managing or sharing photo?

5. What troubles them in their *photo usage*?
6. What are the differences in their photo usage between conventional and digital photos?
7. Do they have different attitude toward conventional and digital photos?
8. Do different members in a family use photos in different ways?
9. What are similarity and differences in photo usage between different families?
10. Which photos are regarded as special and valuable ones?

Which elements do they care most about photos?

11. How do the members in a family interact through *photo usage*?
12. Is there any additional issue worth discussing in the following inquiries?

*Photo usage* profile of each informant family was built through answering these questions; and key issues in each informant's photo experience were captured at the same time.

The data collecting and analyzing approaches in this research are primarily qualitative. All the relevant information gathered through Contextual Inquiry is detailed, multifarious, and jumbled. This information needs to be carefully re-organized for following discussion. Therefore after the in-field studies, the taped interview conversations were transferred into transcripts, which were later coded into key ideas and interpreted under several themes. Finally, features of how people capture, store, browse, share, and display photos, their attitudes toward photos at home, and their uses of photo-related appliances in domestic sphere were presented in the next chapter.



## 4 FINDINGS

In this chapter, findings that cover several elements of *photo usage* at home, such as people, family context, activities, media, and technologies, are summarized from the interview transcripts. The findings are coded into several themes and presented under these themes for designers of digital photo devices to know the characteristics of home *photo usage* clearly and well. Three main themes in this chapter are: photo-related activities, *photo usage* in different family life stage, and differences between conventional and digital *photo usage*.

### 4.1 Photo-related Activities

Photo-related activities at home are categorized into photo taking, managing, browsing, sharing, and display in this section. The findings about people's photo-related activities including people's habits and preferences, the annoyances, and the tools people use, are described as follows.



#### 4.1.1 Photo Taking

People like to take photos of memorable moments in a natural way for future reminiscence. The occasions for family photo taking include birthdays and weddings of each family member, parents' wedding anniversary, Father's Day and Mother's Day, Chinese New Year, family travel, and some other family reunions. On these particular holidays or anniversaries, members in the family get together to have meals, chat and take photos of all family members attending the party.

Most of the informants consider family photography should be artless and dislike posing their family members before taking photos for them. They prefer to capture more natural and vivid look of their family and record family life honestly for future reminiscence. This can be seen in the quote below from the father of Family 1 (F1).<sup>1</sup>

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<sup>1</sup> In subsequent quotes, the following notation is used to identify speakers: I= Interviewer, M1= Mother of Family 1, F2= Father of Family 2, S3= Only son of Family 3, D4c= Third daughter of Family 4.

*F1: The purpose of family photography is recording dribs and drabs of family life. I would like it to be natural. I am opposed to adding artificial after effects on photos. It is not necessary to take family photos in an artistic way. I think taking family photos isn't that complicated. Interesting dribs and drabs in the family captured with photos will simply become lovely reminiscences after several years.*

When the informants were requested to pick photos having specific meanings to them, many of them use terms such as "for the first time", "rarely", and "memorable" to describe their photos. Photos recorded of memorable experiences can be very special to people. When people look at these photos, they can still recall and describe the special scenes they saw.

Besides, most of them are satisfied with the functions of their cameras. One of the informants said, for a good photo, the moment to take the photo is more important than the camera and technical skills. He indicated that good photos could also be taken with Instamatic (point-and-shoot camera).

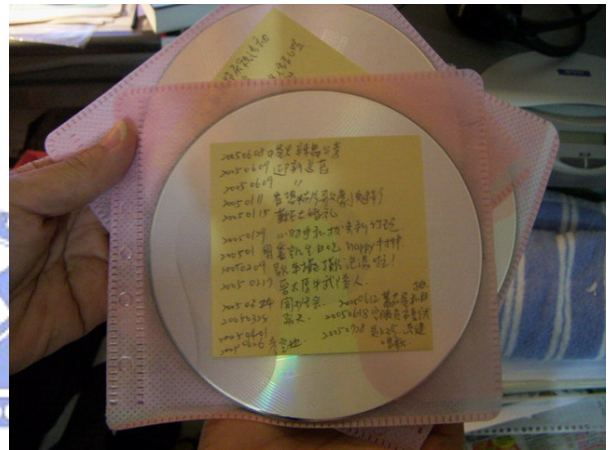


#### **4.1.2 Photo Management**

The most common way people store their photos is putting them into photo albums. Printed photos retrieved from the printing store are packed in light plastic bags (See Figure 3) or little photo albums that are easy to be flipped (See Figure 4). These bags or albums are usually placed in a public area at home such as the living room. Photos in this form are accessible and browsed most frequently. After being in the public area for a few days, part of these photos is rearranged in bigger albums in some families. This rearranging behavior is similar to putting fragmental files in a big file clip. Big photo albums are stored in the closet of the living room or bedroom. (See Figure 5) Since the photos are stored in the closet, people rarely flip them. Likewise, after digital photos were burned into CDs, they were also scarcely browsed. (See Figure 6) In truth, people rarely browse old photos, especially when the photos are not easily accessible.



**Figure 3 (on the left) Photos packed in light plastic bags; Figure 4 (on the right) Little photo albums**



**Figure 5 (on the left) Big photo albums stored in the closet**

**Figure 6 (on the right) Digital photos burned into CDs**

Most people don't take much effort on managing photos. They only organize and annotate their photos simply. Arranging photos in chronological order is the basic way people manage their photos. When conventional photos in the same film are retrieved from the printing store, the clerk in the store puts the photos in plastic bags or photo albums chronologically for their clients. Likewise, when digital photos are transmitted into computers, they are automatically arranged in chronological order. Besides arranging photos in chronological order, some families annotated their photos with dates, places, events and other information on the big photo albums to preserve details of the photos for future remembrance. Most big photo albums are preplanned with memo columns beside the photo columns for users to add annotations. Different from preplanned photo albums, photo scrapbooks allow users to stick

their photos in their own way. One of the informants in this research uses photo scrapbooks to collage his photos enthusiastically with bookmarkers, letters from friends, and other objects related to the photos as decorations. Another informant puts printed material of her tour into photo album of her travel:

*D6a: I used to arrange photos of my first travel aboard carefully in time order. Each photo was well annotated with information about the date, the place and my companions in the photo. I also put the tour schedule on the last page of the photo album as an appendix. After that, however, I rarely organize my photos in such careful way.*

Unlike the enthusiastic informants mentioned above, most of the informants said that they are too busy and too lazy to annotate or arrange their photos carefully. One of the informant families originally put all of their photos in a big brown paper bag. One day when they tried to rearrange their photos into big photo albums, it was hard for them to organize the photos chronologically. Therefore, some of the photos in their photo albums were not arranged in time order, and that bothered them when they flipped the photo albums. Other families also have some loose old photos accidentally found in somewhere at home. These photos are usually later put in the blanks in the photo albums with neglect of their time relations with other photos in the albums. The neglect of the chronological order of photos would cause confusion when viewing photos several years later.

#### **4.1.3 Photo Browsing**

People rarely browse their old photos. The photos they browse more often are those taken or printed lately. Only when they want to find a specific photo or when they move their home, clean their room or reorganize their computer files, they may accidentally find their old photos and start to browse through them. However, once they start to browse the photos and memories of the old days emerge from the bottom of their heart, they cannot stop browsing. Because viewing old photos reminds people the happiness in the old days. When one of the informants was asked about when she browses her old photos, she said:

*When I want to put my photos in order or try to find a specific photo, I flip my old photos.*

*After I start to flip a photo album, I always can't stop browsing another one.*

However, people do not like to browse disordered photos shoved in big boxes. Photos without good management are not attractive. People are more willing to flip photos arranged orderly in the photo albums. Photos with well annotations are even more interesting to viewers.

#### **4.1.4 Photo Sharing**

People are interested in the photos that they are in. After people taking photos together at parties or tours, the one who took the photos share those photos with people who are in the photos. If they like those photos, the photographer will print a copy and mail to them or transmit the digital files to them. Besides sharing photos with the ones who are in the photos, people like to share photos of beautiful scenery on their trip with their family and friends. Old photos are shared when friends of the old days who come to visit. Some people like to share interesting photos with others who have common interests on the topic of the photos. One of the informants shares photos of special cars with his friend:

*I: Whom do you share your photos with?*

*S1: The ones who are interested in the photo. For example, if I took a photo of an unusual car, I would share it with a friend of mine who is interested in cars.*

People share photos of daily life experiences with their distant family members and friends to ease their yearning for them. However, young people are used to share photos in digital form through the Internet while middle-aged people are used to browse printed ones. Therefore, parents who are unfamiliar with computer operation could hardly see photos from their children not at home.

#### **4.1.5 Photo Display**

A few types of photos meaningful to a family are commonly displayed at home: first,

family photos are taken on important days for the family such as wedding anniversaries and birthdays; second, photos which represent each period of the family and reflect the changes of the family such as wedding photos, children's photos in their early childhood, and photos of children's each graduation ceremony (See Figure 7); third, the achievements of family members, for example, photos of a member in the family winning a prize or standing on the top of high mountains; and fourth, photos of deceased family members. Most families like to display these photos in places they usually stay or pass through such as the living room and the hallway. One of the informants displays photos of her children on a bookshelf in the hallway between the living room and the bedroom:

*M1: I put the photo frames of my children at eye-catching places. While my daughter studied abroad and my son was drafted into military service, I often looked at these photo frames. Therefore I put the photo frames at places that I pass through many times a day.*



**Figure 7 (on the left) Photos reflecting the changes of a family**

**Figure 8 (on the right) A photo of a family member's achievement**



On the one hand, People display photos in order to see the photos and the people in the photos more often; on the other hand, the display of family photos would leave an impression of a happy family to relatives and friends come to visit. The displayed photos are usually framed. The photos in the frames are rarely replaced, and the photo frames are rarely moved. Most of the photo frames at home are gifts from relatives and friends or a premium of other merchandise. Only few people buy photo frames for themselves. The preference of photo frames differs from person to person. Some people like fancy photo frames as decorations at home while some other people like simple and elegant photo frames that emphasize the photos inside. (See Figure 9)



**Figure 9 Photo frames in various forms**

One of the informant families is having trouble with displaying their new photos. At present, they display seven pieces of family photo collages instead of enlarged photos on the wall of their hallway in order to display a lot of favorite photos at the same time. (See Figure 7) However, as the new photos keep increasing, they are lacking of space to display their new photo collages. They want to extend the room for photo display, but the size of the wall is limited, and spreading photos on walls beyond the hallway may affect the function of other rooms in the house.

#### **4.2 Photo Usage in Different Family Life Stages**

The meaning of photos at home is convertible. It changes with different family life stages. Considering the composition of families in Taiwan and traditional Chinese culture, Hsie (1989)

divides family life into seven stages according with the growth of the first and the youngest child in the family: first, family of married couple (from the wedding of the couple to the birth of their first child); second, family with pre-school children (from the birth of the first child to his school age); third, family with school-age children (from age six to thirteen of the first child); forth, family with teenagers (from age thirteen to twenty of the first child); fifth, family with launching children (from the first child come of age to the wedding of the youngest child); sixth, family of middle-aged parents (from the wedding of the youngest child to the death of one of the couple); seventh, family of aging family members (from the death of one of the couple to the death of another one of the couple). The finding of *photo usage* in different family life stage is described on the basis of these family stages.

#### 4.2.1 Family of Married Couple

The wedding photos are the first meaningful photos of the family. Before the wedding ceremony, engaged couples hire professional photographers to take sets of wedding photos for them as mementos of the marriage. The wedding photos are then printed on the wedding invitations and the card distributed on the wedding ceremony, and displayed at the home of the couples and the couples' original families. When relatives and friends come to visit, couples share their wedding photos with them. Some couples share their wedding photos on the Internet at the same time. (See Figure 10) Besides, marriage is the start of the affinity between two families. Thus, family members of both the bride's and the groom's original families get together to take a family photo after the wedding ceremony. (See Figure 11)



Figure 10 An online wedding photo album; Figure 11 A family photo after the wedding ceremony

Starting a family life, the couples bring their old photos into their new family. One of the informants started to sort the disordered photos of her husband, and photos of common memories are also brought together. Just married, couples without children are above financial problems and have much more time for dealing with their photos.

#### 4.2.2 Family with Preschool and School-age Children

In this period of family life, almost all the photos in the family are children's photos. The birth of the first child changes the life of the family a lot. The whole family pays close attention to the newborn baby, and the focus of photo taking changes from the daily life of the couple to baby's growth. The couples become parents who take a lot of photos frequently to record every stage in baby's growth, such as birth, starting to crawl, starting to walk, every birthday, etc. (See Figure 12 and Figure 13) This can be seen in the quote below from the mother of Family 3:

*M3: Almost all the photos in the photo albums in this family are my children's photos. I started taking photos of them since they are just little babies. I kept taking photos of both my daughter and my son until they went to high school. There are seven or eight big photo albums of them.*



Figure 12 and Figure 13 Baby's growth record

Mothers are not only diligent in taking babies' photos, but also enthusiastic about sharing their babies' photos with each other at the same time. They put photo frames of their babies in

the office and e-mail babies' photos to their friends. One of the informants gets a lot of photos of babies from her colleagues:

*M2: Before I had a child, my friends who had already have children wouldn't send me their children's photo because I didn't have children. After I became a mother, all in a sudden they started sending me information about raising children and started sharing photos of their children with me.*

Grandfathers and grandmothers are also interested in babies' photos. If they cannot go to their children's homes frequently, sometimes they ask their children to mail their little grandchildren's photos to them. One of the informants puts the photo album of her child on the table every time before her parents come to visit.

After the birth of the second child, there is a heavier financial burden with raising two children, which decreases the spending on photos. Some mothers have to return to work and spend a lot of time on housework at the same time. Parents who were enthusiastic about taking photos of their children now try to reduce costs on photos. Only the remaining from deducting outgoings for necessities is used on treating photos of children. Therefore, less time and money is spent on taking and managing photos of the second child than that of the first child. An informant said she only spend remaining from necessary outgoings on photos after the birth of her second child:

*M4: While we didn't have children, my husband didn't think it is a waste to spend money on photos. But now he does. We have to raise two children now, we must seriously consider before spending. Only extra money would be spent on extra expense such as enlarging photos. I stop printing large photos of my son since he was four months old until now. Therefore my daughter has more enlarged photos than my son.*

But parents still try to take a certain amount of photos of the second child to show equal treatment to both their children. If there is a photo frame of the first child in the living room,

there must be a photo frame of the second child, too. One of the informants indicates that he must consider both of his children when taking photos:

*F2: We have to treat our two children equally. When I take a photo of my second child, I have to consider my first child. Thus, in the last few days when I take more photos of my second child, I take photos of my first child to make up for her. Because my first child likes to view new photos, and she would be jealous of her brother, I think it is necessary to take balance between two children. The desktop of my computer is a photo of my first child, so I put a photo frame of my second child aside for balance.*

#### **4.2.3 Family with Teenagers**

Kids become teenagers after going to high school. Teenagers want to be independent. They do not like to go out with their family neither to take photos with them except in family unions on important holidays. Furthermore, they care more about their peers than their family members, so they take photos with their classmates and friends more often than with their parents. Teenagers also want to maintain their privacy. They do not want their parents to know too much about their daily life, so they rarely share their photos with them. Thus, their photo records kept by their parents since their birth suddenly break off. Without photos of children, the amount of photos in a family decreases to almost none. This can be seen in the quote below from the mother of Family 4:

*M4: After they grow up, they don't want to go out with me anymore. Therefore I rarely get new photos of them after they grow up. In most of their photos at home, they are elementary age. They are not willing to be captured by me since they went to high school. The amount of family photos lessens after they grow up. Only when we go to my mother's home, we take photos together. We don't have chance of going out together. They have their own friends and their own life.*

In addition, teenagers start to care more about their appearance. One of the informants said he used to take photos of himself with new haircut for hours to practice attractive posing.

Teenagers like to show people photos of their attractive appearance to increase self-confidence.

#### 4.2.4 Family with Launching Children

While children leave home for university or military service, some parents display children's photos at places they usually stay (See Figure 14) to ease the yearning for their children. Most university students have many recreational activities on holidays with their classmates in the same department or club. They often take photos together during their activities (See Figure 15) and share photos with each other. However, they rarely share photos with their distant parents. After children leave home, parents also have more time for activities they are interested in, such as traveling. The subject of the photos they take changes from family activities to their own activities. Only on important holidays such as Father's Day and Mother's Day, family members have reunion at home and take photos together.



Figure 14 (on the left) Children's photos displayed by parents

Figure 15 (on the right) Photos of university students having activities

#### 4.2.5 Family of Middle-aged and Aging Parents

After graduation from school, children go to work. Being a freshman in the company, they are too busy at work to spend on taking and managing photos. But after a few years of work, when they have stable income and enough money on deposit, they go travel. Most of the photos in this period of their life are photos of touring (See Figure 16). They shared these photos of beautiful sceneries and different cultures with their colleagues after their journey.

One day, when children get married, the parents give them their own photo albums as presents. These photo albums of the children are created with well annotations since their birth by their parents. Relatively, after parents passed away, children start to put old family photos together into a photo album as a family history to be an heirloom (See Figure 17).



Figure 16 (on the left) Photos of touring; Figure 17 (on the right) An old family photo

### 4.3 Differences between Conventional and Digital Photo Usage

There are differences in people's attitude and usages between conventional and digital photos. Understanding these differences is helpful to the development of digital photo devices which fit in with people's existing *photo usage* habits and enhance their *photo usage* with digital technologies at the same time. Through the inquiries in this research, these differences between conventional and digital photo usages are described as follows.

#### 4.3.1 Digital Photography vs. Conventional Photography

Generally speaking, most people take photos with digital camera nowadays. All of the nine families interviewed in this research have digital cameras. Digital cameras have some features that conventional cameras do not have. There is a LCD Screen on the back of digital cameras, which enables users to see and delete unsuccessful photos immediately on the camera itself. Before there are digital cameras, people who are eager to see and share the photos right after taking use instant cameras. However, the color of the photos produced by instant cameras would fades with time. Moreover, the films for instant cameras are quite expensive for ordinary people. Most of the informants in this research think that with a digital camera, they do not need an instant camera.

In addition, the memory cards in the digital cameras have great capacity for hundreds of digital photos and are rewritable. In contrast, conventional cameras can only carry one film for merely 36 photos a time. After taking 36 photos, a new film must be loaded, and extra money must be paid. For that reason, people take photos more seriously with conventional cameras than with digital ones. Taking photos with conventional camera, the shutter should be pressed after carefully framing the scene. One of the informants said that she couldn't take photos without restraint when using a conventional camera. In contrast, taking photos with a digital camera is more careless. Because of the carelessness in photo taking, the quality of some of the voluminous photos can be really bad. Therefore, it can be time wasting for people to pick up the favorite ones from a large number of digital photos.

Besides the features mentioned above, most digital cameras nowadays have the ability to shoot video and record audio. One of the informants mentioned that he once filmed a music video with his digital camera as homework for art class. After shooting, in order to view the film more clearly, he connected his digital camera to the television and showed his video directly on the television screen. The ability of connecting to various output devices is also a characteristic of digital cameras that differs them from conventional ones.

Despite the popularity of digital cameras, some middle-aged people are still used to take photos with simple conventional Instamatic (point and shoot camera). They are unfamiliar with innumerable functions of digital devices and afraid of causing errors in operation. Thus, they reject to use digital cameras and even give up taking any photo on their trip. There is another group of people who use both conventional and digital cameras at the same time. One of the informants in this research uses each type of cameras in different circumstances. During traveling abroad she uses conventional single-lens reflex camera with wide-angle lenses to capture the panorama of spectacular landscape. In the daily life, she takes photos with her light and portable digital camera.

Besides digital camera, some other devices, such as cell phones, now also include the function of digital photography. In the past, because of the small lens, the quality of the



photos produced by camera phones was not good enough to satisfy most people. Now, the newest camera phones in the market are able to produce digital photos of quite good quality for making prints of 4 x 6" size. However, the prices of these camera phones are still too expensive for most people. Most camera phones owned by the informants in this research are still of low quality. Most informants complained about the small size screen and the low quality of camera phones. For the elderly, it is hard to see things clearly through the small size screens on the camera phones. For those who print their digital photos, the quality of the photos produced by camera phones is not good enough for making prints. For these reasons, most of the informants do not regard camera phone as substitution for digital camera. However, the small size and light weight of camera phones are still commend by camera phone users. At present, most digital cameras is bigger than camera phones in size. People do not bring digital cameras with them everyday, but they always bring their cell phones with them for interconnection with other people when they go out. Therefore, in some situation, camera phone takes advantage of its mobility. For example, when camera phone users walk on the road without their digital cameras and see something interesting accidentally, they can take photos with their camera phones. Camera phones enable people to capture more interesting moment in time in their daily life than before.

#### **4.3.2 Immaterial Photos vs. Material Photos**

Most young people who are familiar with using computers and digitize data do not print their digital photos but only save them in the computers. Being immaterial, digital photos take no room; in contrast, printed photos occupy one's living space by nonstop increase. Nonetheless, although digital photos take the advantage of taking no room, preserving them is a big problem. At present, the general way for keeping digital photos is saving them in the computers and CDs. However, people do not regard hard disks and CDs as dependable storage devices. On the other hand, although printed photos occupy spaces, they are material that would not disappear without reasons at any moment. Considering the dependability of photo keeping, some of the informants expressed their wish of printing their digital photos. But they were also worried about that the great amount of printed photos would cause difficulties in placing and cost a lot of money. Besides, picking out the favorite digital photos

for printing also takes great efforts. Thus, most of the informants have given up the idea of printing digital photos. However, there are still some of the informants who printed digital photos for flipping them in a conventional way. In addition, most people regard printed photos more precious than digital ones. They rarely throw printed photos away even though the photos are not of very good quality while deleting unsuccessful digital photos from their digital cameras and computers is much easier for them.

### 4.3.3 Categorizing and Annotating Digital and Conventional Photos

Annotating digital photos is not as easy as annotating printed ones. Most people categorize their digital photos in separate folders and name the folders with dates and events of the photos, but they can not save their digital photo with additional annotations (See Figure 18). On the side of a photo album, the printed photos inside are labeled with the date and event of the photo set. Inside the photo albums, the photos are annotated easily with dates, places, companions and other information in the note columns beside the photos. (See Figure 19) But generally speaking, being too busy at work to take care of their photos, most people do not pay attention to photo management and annotation in their daily life. When they share the stories of their old photos with others, they often rely on their memories about the content of the photos. However, after dozens of years, their memories about the photos have slipped, people start to regret their negligence of well photo management in the past.

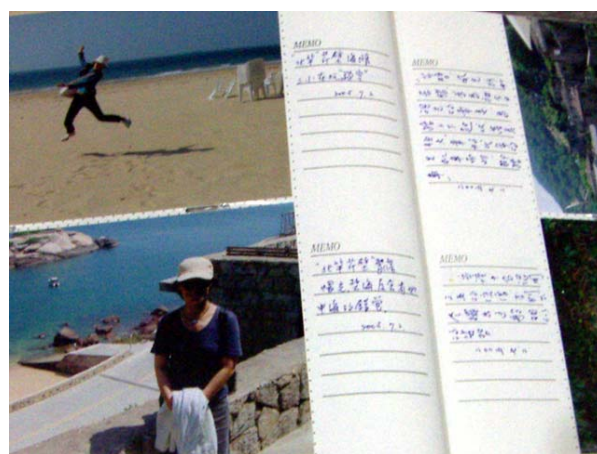
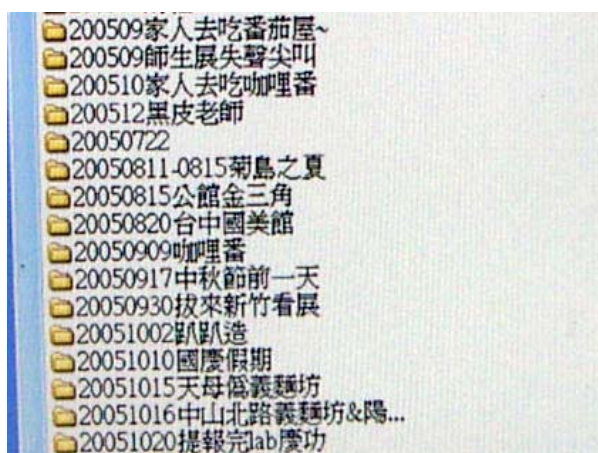


Figure 18 (on the left) Folders named with dates and events

Figure 19 (on the right) Annotation in a photo album

#### **4.3.4 Digital Photo Browsing vs. Conventional Photo Browsing**

Most informants in this research like to flip printed photos more than view digital ones on the screen. Devices such as computers, laptops, and TVs are necessary for browsing digital photos. Therefore, people cannot view digital photos at any place at will. One of the informants said that sitting in the sofa flipping printed photos leisurely is much more comfortable than viewing digital photos in front of a computer screen. Printed photos are tangible and can be hold in hands, which makes it easily browsed. Most parents interviewed in this research do not like to view photos on the computers for being unfamiliar with operating computers. The aches in eyes and shoulders caused by staring at computer screens and clicking mouse also keep them away from view digital photos on the computers. One of the informants indicated that she browsed her photos more often before photos were digitized. Another informant who preferred printed photos said she thinks printed photos are more real and of better quality than digital ones.

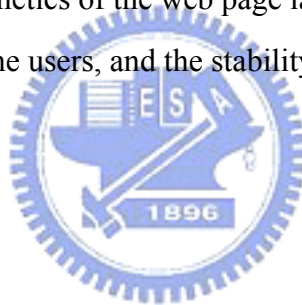
#### **4.3.5 Digital Photo Sharing vs. Conventional Photo Sharing**

Conventional photos can arouse lively face-to-face interaction, while digital photos take advantage of distant sharing. People usually share their digital photos through uploading the photos to online file space or albums. People who want to see the photos, usually their friends and family members, can download or browse these photos on the Internet by themselves. On the other hand, the approach of sharing conventional photos is usually passing photo albums around or flipping photos together. In this way, not only the photographer can interpret his photo to people in person but also people can discuss about the photos with the photographer on the spot. The interaction between photographer and people browsing the photos is livelier than that in sharing photos through the Internet. Nevertheless, digital photos have the advantage of remote sharing. To share printed photos, the only way is mailing the copies. Printing copies of photos costs money, and mailing them takes time, while digital photos can be shared distantly through e-mail, FTP, and online albums immediately and free.

Furthermore, digital photos can be annotated easily in the online photo albums, so some people are enthusiastic about renaming and annotating the photos in their online photo albums

in an interesting way when they want to share these photos with others. With these entertaining annotations, the photos become more interesting for the viewers. However, quite a few people neither add annotations nor carefully pick photos for their online photo albums. Many photos of bad quality are excursively put in the albums, and bore people browsing them. People rarely browse these photos leisurely, but only skim them over quickly. One of the informants said she preferred receiving printed photos than getting e-mails with the web address of a sharing online photo album in. In most of the time, she did not even click the link to their online photo albums.

In addition, when the informants were asked about the reasons why they chose their present online photo album, one of them mentioned the feature of adding links to friends' albums. Another cared more about the user friendly interface for direct cognition and easy adoption. Other reasons included the aesthetics of the web page layout, the amount of users of the web site, the interactivity between the users, and the stability of the web server.



## 5 DISCUSSIONS

In the previous chapter, the findings summarized from the contextual inquiries about people's *photo usage* at home are presented. Underlying these *photo usage*, there are people's motives and things that affect their *photo usage*. In this chapter, two points from the findings are discussed in order to find out implications of the implement of information technology for future photo-related devices and services at home. On the one hand, insights in terms of the meaning of photos in the domestic sphere to a family and members in the family are revealed. On the other hand, key factors about how digital technologies influence photo usage at home are discussed.

### 5.1 Meaning of Photos to a Family

Photos play an important role in maintaining relationships between family members. The meaning of photos to a family can be identified as creating personal or family histories, preserving memories, substituting for one's love, and sharing experiences, as follows.

#### 5.1.1 Creating Personal or Family Histories

Photo collections over a long period of time are regarded as records of personal and family histories. People generally have to pass through many stages in their life, including being born, coming of age, getting married, having babies, aging, and facing death. Most parents take photos once in a while to record the stages in their children's growth. By flipping the photo album that consists of these photos, it is easy to see the changes in one's appearance. Like its members, a family also changes with time and has its own history. One of the informants in this research picked out photos from each period of her family and displayed them on the wall at home. Another informant collected photos of her relatives of the same generation in their childhood and rearranged their photos into a photo album. These photo collections are like epitome of a family that reflects the changes of the family members and their home environment. As Van House [13] said, these photos are material traces of the continuity of the family over time and place. By inheriting old family photos, the history of the family is permanently hung over. Children have chances to know more about their parents through the

old photos in their youth. Junior generations are able to be more acquainted with the histories of their family through photos of their ancestors.

### **5.1.2 Preserving Memories**

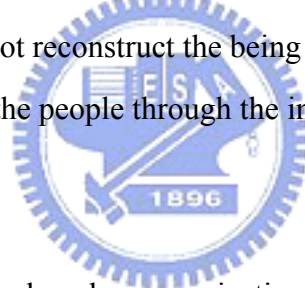
Photos preserve memories for people. It is hard for people to remember everything in their life. As time passes by, the most memorable events are sometimes forgotten. Chalfen [8] has quoted Zelizer's claim that "In the contemporary age, memory has come to be seen as depending on an array of media technologies, from radio, cinema and computers to the printed press. Externalizing memory outside the human brain has thereby engendered diverse alternatives for its embodiment elsewhere", and suggested that home media specifically collections of family photos have been overlooked as a serious site of such embodiment. People like to take photos of memorable family events such as birthdays of family members, children's graduation ceremony, family trips, etc. One of the informants indicated that taking photos is like keeping a diary with the camera which records every moment of one's life. Taking photos with digital cameras consumes no films and that allows people to take photos more careless and capture whatever scenes they are interested in. Therefore, comparing to conventional photography, digital photography preserves more dribs and drabs of one's life. Viewing these photos would remind people of the old days even after many years.

### **5.1.3 Substituting for one's love**

One's portrait is regarded as a substitution for the person. Lovers put photos of each other in their wallets. Looking at the photo of one's love is like looking at him in his face, makes people in love feel happiness. While children leave home for school or work, parents display their photos at places they usually stay to ease the yearning for their children. One of the informants working away from home said he once felt lonely and homesick, and the family photo on his cabinet gave him comfort and let him feel the company of family. People also hang photos of deceased family members in the living room like that they still accompany the family.

Viewing photos of one's family and friends reminds people memories about them and

triggers related emotions. When one informant was asked to choose photos which have specific meanings to him, he mentioned a family photo. The photo was taken after his grandmother passed by and members in the family reunited for holding her funeral. Before the informant's grandmother passed by, his family members were fighting for something; but during the mourning period, the family got together and restored their relationship. The photo was taken in this circumstance. For people not in his family, it is probably merely a family photo; but for him who has close relation to the people in the photo and experienced the event, the photo triggers his emotions. The trigger of memories and emotions in a photo is termed as the "punctum" by Barthes [26] in "Camera Lucida: Reflections on Photography". Barthes indicated two elements in viewing photos: "studium" and "punctum". The studium is the informational and aesthetic aspect available to everyone while the punctum is specific to the individual. The punctum could be described as a small detail in a photo which triggers a succession of personal memories and unconscious associations [9]. Viewing the photo of one's family and friends does not reconstruct the being of the people in the photos, but arouses one's memories about the people through the image.



#### **5.1.4 Sharing Experiences**

In the present day, highly-developed communications have facilitated people's migration. Many people leave their home from for study or work. The separation between family members causes isolation and loneliness. Technologies are helping to solve this problem by supporting the connection between separate family members. Since digital files including digital photos are transmitted instantly through the Internet, sharing photos has become much easier than before. Nowadays, people are more willing to share life experiences and emotions with distant family and friends by sharing daily photos. Besides, digital photos in the online photo albums are annotated easily. While viewing these photos with annotations, family and friends of the photographer are able to know his life in the distant place better. With 3G camera phone, sharing interesting experiences at any place and any time is even easier. Sharing photos of what's going on in one's life is not only a form of reporting or journaling, but also a way of connecting to beloved ones [13]. Furthermore, by sharing and viewing photos of family members, the domestic spatiality is stretched beyond the walls of the home

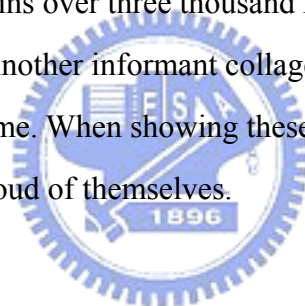
through the relation with people, places and times that are not in the home [27]. Separate family members are closely linked to each other in this stretched home.

## **5.2 Meaning of Photos to an Individual in a Family**

There are some usages of photo at home that are more meaningful to an individual than the family. These meaning of photos to an individual in a family can be identified as manifesting achievements, creating artwork, and developing social relationships, as follows.

### **5.2.1 Manifesting Achievements**

Some photos are regarded as marks of achievements. People generally enlarge their photos of graduation, winning prizes or standing on the top of the mountains and display them at home as reminders of their accomplishments. One of the informants showed photos in her youth of climbing high mountains over three thousand kilometers with heavy backpack proudly during the interview. Another informant collaged photos of his art works exhibited at the art museum into a large frame. When showing these photos to other people or their family members, most of them feel proud of themselves.



### **5.2.2 Creating Artworks**

People like to take photos of beautiful scenes rarely seen during their journey. They care more about the aesthetic aspect of these photos than photos of family members. When people are taking photos of golden sunsets, bloomy flowers, and spotless snow, the shutter is pressed after carefully framing the scene. One of the informants enjoys taking scenery photos very much and called these photos her “works”. Besides, she used them as the desktop of her computer. When her colleagues praise her for her photos, it makes her feel accomplished. Sometimes, some of the family photos can be regarded as artworks as well. Some people distinguish their photo taking that is for recording family events from their photos for art and fun [13]. One of the informants sometimes draws himself out of his family life, and takes photos of his family members artistically as they are just subjects to be shot.



### 5.2.3 Developing Social Relationships

While browsing photos together, people share stories with others. People about the same age often find similar past experiences in the old photos and initiate lively conversations. Photographs on display can easily function as an initiator or a topic of social exchange [22]. When friends of the old days come to home and see the displayed photos of children away from home often find changes of them and ask their parents about their latest information. By browsing photos together, people are more acquainted with each other and their families. Besides, people like to share interesting photos with others who have common interests on the topic of the photos. One informant in this research shared photos of special cars with his friend interested in cars. Encountered information is shared to develop rapport between giver and recipient [29]. The content must appropriately reflect the interests of both, but the actual communicative intent of the act, to say something like “we have common concerns” or “we have the same sense of humor”, is more important.

### 5.3 The Impact of Digital Technology on Photo Usage

In section 4.3, the differences between conventional and digital *photo usage* discovered through the inquiries are described. In this section, key factors about how digital technology influences these *photo usages* are generalized accordingly as follows.

#### 5.3.1 Digital photos for Sharing and Conventional Photos as Mementos

In previous section, digital photography and conventional photography have both shown their advantage and disadvantage. Because of their different attributes and applications, people differentiate the usage between conventional photos and digital photos. Digital cameras enable people to take digital photos without restraint. Digital photos are immaterial and take no room. Besides, sharing digital photos with distant family and friends is much easier than sharing conventional ones. Therefore, digital photos, which are taken freer and have the advantage of remote sharing, are used as convenient media for daily life experience sharing. On the other hand, being material, conventional photos would not disappear without reasons and are more reliable in keeping. Besides, annotating conventional photos is easier than annotating digital ones. This makes browsing and sharing conventional photos more

interesting and lively than browsing and sharing digital ones. For these reasons, conventional photos, which are more reliable in keeping and often well annotated, are relatively more suitable as mementos that preserve remembrance of people and the good old days.

### **5.3.2 Differences in Technology Acceptance between Family Members of Different Age**

There are differences in technology acceptance between family members of different age. Young people often bring their digital cameras or camera phones with them and capture interesting moments in their daily life. Most of them are willing to try the innovation functions of digital cameras, such as shooting short films and connecting the digital camera to the television for playing videos on the television screen. Young people rarely print their digital photos and are used to browse their photos on the computer. Most of them are familiar with computer applications. They share and exchange their digital photos with friends through uploading the photos to online file spaces and albums, or by transmitting the photos through MSN. Most of them do not reject to show their photos to the public on the Internet. On the other hand, some middle-aged people are still used to take photos with simple conventional Instamatic. They are unfamiliar with the innumerable functions of digital devices and afraid of causing errors in operation. Middle-aged people are used to browse printed photos. They prefer flipping printed photos to viewing digital ones in front of a computer screen. They share their photos with relatives and friends by flipping photo albums together, passing photos around, or mailing the copies to the recipient. They do not like to share their photos on the Internet for the consideration for personal privacy.

In brief, young people accept new technology better than the middle-aged people. They are more willing to adopt various computer applications. In "Diffusion of Innovations", Rogers, E. [28] categorized innovation adopters into five segments, according to the adoption period required to an individual, which are innovators, early adopters, early majority, late majority, and laggards. Innovators, early adopters, and early majority are the earlier half adopters, who require a shorter adoption period, while late majority and laggards are the later half adopters, who have a lengthy innovation decision process. The earlier half adopters have more formal education, higher socioeconomic status, more mass media exposure, more social participation,

and more cosmopolite. In addition, they are venturesome, and have the ability to understand and apply complex technical knowledge. On the contrary, the later half adopters are more cautious, more suspicious of innovations; neighbors and friends are their main information sources.

In most families, the young children are more like the earlier half innovation adopters, who adopt innovative technology appliances in a shorter period. Although they do not have a higher socioeconomic status in a family, but they are more venturesome, and more mass media exposed. They also have the ability to understand and apply complex computer and Internet techniques. These make them more willing to try new digital photo technology appliances. The middle-aged parents are relatively more like the later half innovation adopters, who are more cautious and suspicious of new technologies. Rogers, E. [28] indicated that there is a very important connection between the earlier adopters and the later adopters. The later adopters would consult the earlier adopters about information and suggestions of new products. Therefore, the diffusion of innovative digital photo products at home relies on the recommendation and instruction from the young children to their parents.

### **5.3.3 Big gulf of Photo Sharing between Generations**

As it shows in the previous section, there are differences in technology acceptance between family members of different age. These differences are causing a big gulf of photo sharing between generations. On the one hand, most young people do not print their digital photos but only save them in their computers and CDs. They share and exchange the digital photos through online photo albums and MSN. On the other hand, due to the long-term habit and being unfamiliar with computer use, the middle-aged people prefer viewing and sharing printed photos instead of digital ones. The *photo usage* is quite different from parents to children. Therefore, as the main stream photo technology shift from conventional to digital, it is getting harder for the middle-aged parents who are unfamiliar with computer operation to share and exchange the latest photos with their young children away from home.

### **5.3.4 Difficulties for Adopting Computing Technology at Home**

As digital technologies make great strides these years, a lot of digital devices, services, and software supporting photo management and photo sharing have entered the market. However, some of these products are facing resistance on gaining acceptance at home because of the complexity of them. Since the domestic atmosphere is slow and calm, fast and heavy information flow at home may sometimes influence the atmosphere and cause people information anxiety. Digital photo devices or online services surely can help people manage and share their photos better, but setting and maintaining these complex products with numerous functions would also take a lot of time and effort. This kind of lousy work departs people from their wish of a leisure life at home. It is somewhat contradictory that people expect information to be systematical and available at home at any time, but do not like to spend much time on maintaining it.



## 6 DESIGN IMPLICATIONS

After the discussion about the meaning of photos in domestic sphere and the benefits and breakdowns of present artifacts supporting *photo usage* at home, the implications for future device and service design of *photo usage* are delivered in this chapter. The purpose of these implications is not proposing concrete design concepts, albeit it is definitely possible; instead it looks at some rather broader trends in the way that people engage with existing technologies and the importance of their domestic space and social networks to the way people will engage with future technologies aimed at photo-related service and products in domestic sphere.

### 6.1 Automatic Photo Management

Most people are too busy at work to spend time on photo management in their daily life. Therefore, some of them do not organize their digital photos chronologically and systematically but only shove the photos in the “folders”. However, the neglect of photo management would cause confusion when viewing photos several years later. It shows in the studies that good photo management helps the preserving of valuable memories. "Automatic Photo Management", for example, provides the opportunities to help family members categorize their digital photos and arrange the photo sets chronologically. It could be software installed in the computers or online service that reads the metadata of digital photos and manages photos according to these metadata automatically. With "Automatic Photo Management", people who do not have time to manage their photos or who are unfamiliar with operating computers would not have to be worried about managing their photos.

### 6.2 Bridge between Printed Photos and Digital Photos

Photo sharing helps separate family members participate in each other's life and ease the yearning for each other. However, there is a big gulf of photo sharing between generations. Most young people are used to share photos in digital form through the Internet while their middle-aged parents, who are unfamiliar with the use of computer, prefer viewing and sharing printed photos. Thus, there should be a transit mechanism between printed photos and digital photos that bridge the gulf of photo sharing between family members of different generation.

For instance, "Photo Scanner" can help middle-aged parents scan their conventional photos easily and transmit the transferred digital photos into personal computers or online photo albums through some software kits. "Tangible Digital Photos" are tangible displays of digital photos. Being made of electronic paper, it materializes digital photos as rewritable photo cards. Through the transformation, digital photos can be passed around for perusal by family members with clumsy computer skills.

### **6.3 Personal/Family History Creation**

Photo collections are like epitome of a family that reflects the changes of family members and home environment. People record significant family events in detail with photos and do not want to leave out any important moment. Most parents take photos to record stages in their babies' growth. The idea of "Baby's Diary" is a photo album for recording babies' growth with pre-planned columns for each stage of babies' growth, such as the birth, first stand, first birthday, etc. Parents can fill blanks in the photo album orderly by taking photos of every important stage in their babies' growth. They can also share their babies' photos through "Baby's Diary Online". "Baby's Diary" reminds parents every important moment to take photos of their babies and helps parents record the growth of their babies regularly. Besides, people also want to hang over the history of their family permanently by inheriting family photos. A "Family History Recorder" which includes family photos and stories might be a meaningful photo-related service at home.

### **6.4 Memory Preservation Assistant**

Photos are like diaries which record memories in one's life. People like to share stories of the old days with their photos. However, after dozens of years since the photos were taken, they generally reveal their forgetfulness about the details of the stories in photos. Some informants in this research preserved the information of the photos through well annotating. Photos with good annotation are more lively and expressive for browsing, recollecting, and sharing. Even so, most people are too busy, too lazy, or having difficulty on annotating their photos carefully. Van House, et al [13] indicated that the possible solutions to this resistance include greater automation, incorporating metadata into the flow of social uses surrounding

personal photos, and seamlessly creating metadata as a byproduct of these uses. The following two concepts respond to Van House's suggestions. Digital cameras with “Annotator” can record photographers’ talking during photo taking, and transfer their talks into text annotations in the metadata of the photos. People do not have to pay extra efforts on annotating. Besides, when people are sharing stories with photos, the “Story Photo Frame” can record people’s conversations on these photos, and add the audio information on them. More discussion on the photos, more stories are added to the photos. While the photos are browsed with “Story Photo Frame”, the audio information would played simultaneously, and make photo browsing more interesting.

### **6.5 Substitution for One’s Love**

Portraits are regarded as substitutions for one's love. With a photo of one’s family members put in the wallet, the person can feel the company of them. People carry photos of their family with them, not because they want to see the photos all the time, but just feeling the existence of the photo (or their family) is enough to comfort them. Watches and cell phones are devices that people usually carry with, which are convenient carriers for photos on one's person. By pressing a button on the "Photo Watch", the dial would change from time display to a cherished photo when people want to see or share the photo with others. For young people, "Photo Accessories" hung on cell phones, which are cute and have tiny display for them to put their favorite photos in, may be even more attractive.

### **6.6 Remote Experience Sharing**

Separate family members are eager to know the latest news of each other. It is a good way to ease this yearning by sharing and browsing daily life photos of each other. Through the Internet, digital photos can be transmitted instantly between geographically distant computers. However, most middle-aged parents missing their children are unfamiliar with using computers. “Remote Updateable Photo Frame”, which is a digital photo frame connected to the Internet, provides an easy way for children away from home to report what's going on in their life to distant parents by uploading digital photos to the photo frame at home, and at the same time provides a conventional way for the parents who are unfamiliar with computers to

see the latest photos of their distant children without facing any operational difficulty. With a 3G camera phone or a wireless digital camera, children in a foreign country can even capture and share their daily life experience real time by updating the digital photo frame at home. A set of “Remote Updateable Photo Frame” linked to each family member away from home is just like a family tree that shows all the family members' latest photo and activities on it. The family tree photo frame set would stretch the space of home and maintaining relationship between the family members. The "Remote Updateable Photo Frame" can also be combined with TV, the most popular visual media at home, for the consideration for family members to operate even more easily.





## 7 CONCLUSIONS

In this research, through the in-field investigation to users' existing experience of both conventional and digital photos, information about people's photo-related behaviors and their attitude toward photos at home is revealed. The relationships between family members and their photos are also explored.

People take photos at memorable moments of their family for future reminiscence. Parents create big photo albums for each of their children as a record of children's growth. Old family photos are put together as a family history and an heirloom. Photos of deceased family members and family photos taken on special days such as birthdays of family members are displayed at home to smooth over other the yearning for people in those photos. To share daily life experience, people send photos to their distant family members. In brief, photos are used to maintain relationships between family members [13].

Photos maintain relationships between family members through various applications. Seven different meanings of photos at home to family members, including creating personal or family histories, preserving memories, substituting for one's love, sharing experiences, manifesting achievements, creating artwork, and developing social relationships, are identified in this research. Photos reflect the achievements, growth, and changes of the family. Viewing old photos reminds people of the past family life. Portraits of family members are used to ease other family members' yearning for them. Experiences and emotions are shared with distant family members through photos. Sharing photos starts conversations in a family. Photo-related activities, such as photo taking, organizing, browsing, sharing, and display, improve the relationships between family members [12] and extend the record of family histories.

Besides generalizing the meaning of photos at home to family members, the impact of digital technology on *photo usage* are also revealed in this research. Digital cameras have some features that conventional cameras do not have, such as the great capacity for photos

and the LCD screen that enables users to see and delete photos immediately. These features make taking photos with digital cameras much freer than taking photos with conventional ones. Digital cameras produce digital photos, which are immaterial and take no room. Besides, through the Internet, sharing digital photos with distant family and friends is much easier than sharing conventional ones. However, conventional photos have their own advantage. Being material, conventional photos would not disappear without reasons and are more reliable in keeping. Besides, annotating conventional photos is easier than annotating digital ones. These make browsing and sharing conventional photos more interesting and lively than browsing and sharing digital ones. In brief, digital photography and conventional photography both has its advantage and disadvantage at present. Therefore, people differentiate between conventional photos and digital photos because of their different attributes and applications. Digital photos, which are taken freer and have the advantage of remote sharing, are convenient media for daily life experience sharing. Conventional photos, which are more reliable in keeping and often well annotated, are relatively more suitable as mementos that preserve remembrance of people and the good old days. Therefore, digital photography has not fully replaced conventional photography presently. How to upgrade the value of digital photos and amplify the usage of sharing information with digital photos are still discussible issues.

Inspired by studying family activities, good domestic appliance design will increase family members' acceptance of technology and enhance their quality of life. Through contextual inquiries, it is discovered that some photo-related appliances are not accepted by people because these technology appliances were not created after considering how users live and what users really care under domestic environment. According to the above revealing of the meaning of photos at home to family members and the impact of digital technology on *photo usage* through in-field studies, the implications for various digital photo device and service design that fit in with existing *photo usage* are delivered in this thesis. It is suggested that digital photo devices and services should be designed as memory preservation assistant and substitution of one's love, or designed for supporting personal/family history creation and remote experience sharing. The development of automatic photo management and the bridge

between printed photos and digital photos are also proposed. These design implications are helpful for inspiring more complete design concepts that fit in with different contexts in people's life.

This thesis contains insights of future photo-related device and service development through the studies of *photo usage* at home. It is believed that these insights will inspire the design of future photo devices and services that fit in with people's life better. Furthermore, in this research, we provide a design research process in developing innovative digital technology applications through exploring the meaning of objects in the domestic sphere. This study can not only be applied in photo-related industries, but also build a cross-discipline method for studying the relevance between social world and technology.

Inevitably, there are some limitations in this research. The informants recruited for contextual inquiries were mostly acquaintances of the researchers in this research. The researchers are from Hsinchu, for the convenience of communication, all the informant families live in northern Taiwan, especially in Taipei and Hsinchu. Taipei and Hsinchu are two cities relatively highly developed in information technology in Taiwan. All of the informant families have computers and digital cameras. Most of the family members in these families have the ability of basic computer operation such as word processing and sending e-mails. However, families in the country maybe do not have the same technology capability. The influence of digital technology on their *photo usage* is possibly not so obvious than that on the families in the city. Additional users in different area should be inquired in the future for creating a more complete picture of users' needs for digital *photo usage*.

In addition, at the end of every inquiry, pictures of photo devices and services currently in the market were shown to the informants for obtaining their attitude toward these products, the way they might want to use them, and their existing experience of related products. However, with the pictures and the brief introduction by the researchers only, it seems a little bit hard for the informants to be really familiar with the products. Therefore, their feedbacks about the products are somewhat affected by researchers' introduction. If possible, displaying

real products for the informants to operate directly or demonstrating the products with instruction videos may increase the informants' understanding to the products and help the researchers get more information.

In the end of this thesis, there are some suggestions for the direction of related studies in the future. The design implications delivered in this thesis facilitate the following process of concept design and prototype development. To test the usability of the design concepts and gather more rigorous opinions from users, field trials of prototype should be conducted. During the field trails, the researchers and participants can discuss together to improve the design and make it more fit in with users' needs. The participants' opinions during the field trails also help researchers propose further explicit design guidelines as reference for the design of digital photo devices in the future.

Besides, in the contextual inquiries, several informants mentioned their experience about shooting videos. Videos are similar to photos in recording events and preserving memories, but they are dynamic images while photos are static ones. One informant shot home videos for recording his babies' action. Once his babies had learnt a new movement, he took up his digital camcorder to shoot clips of their movement immediately. Another informant once filmed a music video with his digital camera as homework for art class. While some informants are interested in shooting videos, other informants still prefer viewing photos to watching videos. Videos record continuous movements, so the contents are sometimes repeating and less entertaining which make people less willing to spend long time on watching them. On the contrary, when taking photos, people only capture the most interesting moments. The contents of photos are more diverse and attractive for viewing. Besides, photos can be printed and are easily browsed by holding in hands, but videos must be watched with devices such as TVs. Therefore, people view photos more often than videos. The similarities and differences between videos and photos are worth investigating. However, as digital camcorder gets popular among families in Taiwan, research about home video usage is still absent. Therefore, home video usage is suggested as a discussible subject in future studies.

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## Appendix A: The Recruiting Plan for Contextual Inquiry

### Participant Recruiting Criteria

訪談目的：	了解使用者使用家中相片的經驗(使用行為與其意義)
對象：	日常生活與照片接觸頻繁、相片使用經驗豐富的家庭中，參與拍攝、管理或分享照片任一活動的家庭成員
地點：	受訪家庭家中
日期：	See schedule
訪談時間：	約 2 小時

### Screen Criteria

家庭型態：	A.目前沒有子女的年輕夫妻 B.有學齡前子女的年輕夫妻 C.有青少年子女的中年夫妻 D.剛進入空巢期的家庭，孩子剛離家求學或就業不久 E.子女已結婚分家的退休老年夫妻 F.三代同堂的家庭														
照片使用經驗：	受訪對象須為日常生活與照片接觸頻繁、相關經驗豐富的家庭														
相片使用行為的多樣化：	受訪對象盡量是相片使用行為彼此不同的家庭： 不同的拍攝器材：傳統相機、數位相機、照相手機、拍立得、izone 大頭貼相機、lomo 等 不同的管理方式：相簿、電腦、光碟等 不同的分享方式：翻閱相簿、吸在冰箱、電視播放、郵寄照片、網路相簿、電子郵件等														
預定招募個數：	各使用器材招募家庭數														
	<table border="1"><thead><tr><th>家庭型態</th><th>家庭數</th></tr></thead><tbody><tr><td>A.目前沒有子女的年輕夫妻</td><td>1</td></tr><tr><td>B.有學齡前子女的年輕夫妻</td><td>2</td></tr><tr><td>C.有青少年子女的中年夫妻</td><td>2</td></tr><tr><td>D.剛進入空巢期的家庭</td><td>2</td></tr><tr><td>E.子女已結婚分家的退休老年夫妻</td><td>1</td></tr><tr><td>F.三代同堂的家庭</td><td>1</td></tr></tbody></table>	家庭型態	家庭數	A.目前沒有子女的年輕夫妻	1	B.有學齡前子女的年輕夫妻	2	C.有青少年子女的中年夫妻	2	D.剛進入空巢期的家庭	2	E.子女已結婚分家的退休老年夫妻	1	F.三代同堂的家庭	1
家庭型態	家庭數														
A.目前沒有子女的年輕夫妻	1														
B.有學齡前子女的年輕夫妻	2														
C.有青少年子女的中年夫妻	2														
D.剛進入空巢期的家庭	2														
E.子女已結婚分家的退休老年夫妻	1														
F.三代同堂的家庭	1														

## Appendix B: The Screener for Recruiting

### 相片使用經驗研究問卷

您好，這是一份有關相片使用經驗的研究問卷，想耽誤您五分鐘的時間請教您幾個簡單的問題。這個研究的主持人是交通大學應用藝術研究所的鄧怡莘副教授，參與的研究員有博士班研究生劉家成、張華憫，以及碩士班研究生陳俊宇、王鈺喬。本研究中的資料僅供學術使用，並不會將您的資料外流，請您放心！如果您有任何疑問的話，歡迎您打電話 (0926916996)或 e-mail (gglight1128@yahoo.com.tw) 向我(陳俊宇)詢問，謝謝！

(以電子檔回覆問卷的受訪者，請複製「■」作答，例如：■ 是 □ 否)

請問您目前的婚姻狀況是？  單身  已婚

請問您目前家中的成員有哪些？

父  母  兄弟姐妹\_\_\_\_\_個  配偶  孩子\_\_\_\_\_個，(各)\_\_\_\_\_歲  
 祖父  祖母  岳父/公公  岳母/婆婆  其他\_\_\_\_\_

請問您目前的居住狀況是？  住在家裡  不住在家裡

(針對已婚且有孩子的受訪者) 請問您的孩子目前的居住狀況是？  住在家裡  不住在家裡

請問您家中成員的照片使用情況：

家中成員：		自己				
使用過的拍照器材 (可複選)	傳統相機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	傳統單眼相機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	數位相機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	數位單眼相機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	照相手機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	其他	_____	_____	_____	_____	_____
	無	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
目前擁有的拍照器材 (可複選)	傳統相機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	傳統單眼相機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	數位相機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	數位單眼相機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	照相手機	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	其他	_____	_____	_____	_____	_____
	無	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



常拍攝的主題是？ (可複選)	家族活動	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	小孩	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	朋友聚會	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	旅遊	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	有趣事物	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	創作	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	其他	_____	_____	_____	_____	_____
最近一次拍照的時間是？	一週內	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	一個月內	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	一年內	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
如何處理實體照片？(可複選)	不特別整理	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	放入相本	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	放入相框	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	貼在桌前/牆上	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	其他	_____	_____	_____	_____	_____
如何處理數位照片？(可複選)	傳輸到電腦裡	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	燒成光碟	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	沖印出來	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	其他	_____	_____	_____	_____	_____
透過什麼方式和別人分享實體照片？ (可複選)	一起看相本	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	吸在冰箱上	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	相框放在客廳	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	郵寄	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	其他	_____	_____	_____	_____	_____
透過什麼方式和別人分享數位照片？ (可複選)	以電腦播放	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	以電視播放	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	E-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	網路相簿	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	共同網路空間	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	印製在禮品上	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	其他	_____	_____	_____	_____	_____

以上謝謝您的作答。(若於電腦上作答請將問卷回傳到 [gglight1128@yahoo.com.tw](mailto:gglight1128@yahoo.com.tw)，謝謝。)

依據以上資料篩選，若您與您的家人為我們希望更進一步訪談的對象，且你們願意接受訪問，將由我們 4 位研究所學生到您家進行約 2 個小時的訪問。我們將請您與您的家人各自挑選五張自己認為「特別」的照片，這些照片必須由您或您的家人所拍攝，並且曾有兩位以上的家庭成員看過。我們將針對這些照片，向您與您的家人訪問您家中的相片使用經驗。訪問結束後，我們將致贈受訪家庭 1000 元訪談費。

- 請問您與您的家人是否願意接受我們的登門拜訪？  願意  不願意  
(若您的答案為「不願意」，請填入您的基本資料後問卷結束，謝謝您的作答)

- 您希望的訪談時間：

日期	星期	上午	下午	晚上
2/25	六	時 分起	時 分起	時 分起
2/26	日	時 分起	時 分起	時 分起
2/27	一	時 分起	時 分起	時 分起
2/28	二	時 分起	時 分起	時 分起
3/1	三	時 分起	時 分起	時 分起
3/2	四	時 分起	時 分起	時 分起
3/3	五	時 分起	時 分起	時 分起
3/4	六	時 分起	時 分起	時 分起
3/5	日	時 分起	時 分起	時 分起
3/6	一	時 分起	時 分起	時 分起
3/7	二	時 分起	時 分起	時 分起
3/8	三	時 分起	時 分起	時 分起
3/9	四	時 分起	時 分起	時 分起
3/10	五	時 分起	時 分起	時 分起
3/11	六	時 分起	時 分起	時 分起
3/12	日	時 分起	時 分起	時 分起

• 以上時間均不方便，我希望的訪談時間是：\_\_\_\_\_

- 您的基本資料：

姓名：\_\_\_\_\_ 性別：男 女 年齡：\_\_\_\_\_ 職業：\_\_\_\_\_

手機：\_\_\_\_\_ 電話(O)：\_\_\_\_\_ 電話(H)：\_\_\_\_\_

地址：\_\_\_\_\_

E-mail address：\_\_\_\_\_

### 實地訪談進行流程與執行事項

#### 壹、召開訪談前說明會

- 分配訪談工作
  - 所有研究人員需熟讀研究計畫與提問腳本
  - 主要提問人提問，其他人若有問題亦可當場提出
  - 一人負責全程筆記（除記錄對話內容外，需紀錄受訪者表情、情緒）及錄音
  - 一人負責用數位相機拍照，並協助記錄受訪者訪談要點
  - 確認各研究人員訪談當天應攜帶的物品
- 實地研究的目的
  - 透過受訪者陳述意見的方式、用語以及所做的行為來瞭解受訪者
  - 廣泛並鉅細靡遺地觀察與探詢任何受訪者家中有關居家照片使用的物品與環境，亦可包括任何與居家照片使用相關的特殊活動
- 詢問問題注意事項
  - 儘可能避免引導受訪者
  - 盡量問開放式的問題
  - 盡量不要打斷問話以及受訪者的回應與動作
  - 避免顯示任何可能會讓受訪者感到尷尬或覺得愚蠢的表情或動作
- 提問腳本
  - 整個訪談過程盡量依據腳本來進行
  - 若有一些有趣的突發問題或發現，可利用最後五分鐘的時間提出

#### 貳、攜帶物品 check list

- |   |  |
|---|--|
| <input type="checkbox"/> 錄音設備（注意充電情況）     | <input type="checkbox"/> 提問腳本（含提問問題、展示用圖片） |
| <input type="checkbox"/> 相機（注意充電情況、記憶卡空間） | <input type="checkbox"/> 保密協定（一式二份）        |
| <input type="checkbox"/> 學生證或名片（表示為交大學生）  | <input type="checkbox"/> 受訪費(置於信封內)、領據及小禮物 |
| <input type="checkbox"/> 筆記本、筆            |  |

#### 參、進行訪談流程（討論內容詳見提問腳本）

- 一、開頭介紹與器材準備(5 mins)
- 二、進行深度訪談 (105 mins)
- 三、結尾 (10 mins)

#### 肆、召開觀察後討論會（討論重點詳見提問腳本）

# 提問腳本

## 訪談流程：

### 一、開頭介紹與器材準備(5 mins)

- 自我介紹與介紹其他來訪者
  - 您好！我是交通大學應用藝術研究所的學生叫做○○○，很高興您答應接受我們的訪問，等一下訪談主要由我來提問。旁邊這一位是○○○，是一起進行這個研究案的同學，他將會在旁記錄我們的談話，而○○○則會負責拍照，紀錄訪談中提到的相關物品。
- 說明研究內容與研究目的
  - 這個研究案是交通大學應用藝術研究所鄧怡莘副教授的國科會計畫，計畫名稱是「居家環境之影像角色與使用經驗探討與分析」，這個研究的目的是在於了解台灣家庭使用照片的模式、態度與方法，進而提出居家之數位影像工具設計的基準與原則。
- 詢問受訪者是否有任何要求需要我們配合
  - 請問您是否有哪些特殊的要求需要我們配合？
  - 如果在訪談進行中有任何不適或由於我們的訪談造成您的壓力，請不要吝於告訴我們您的感受。若有任何問題是您不想回答的，您也可以選擇不作答。
- 提醒受訪者我們將會在訪談進行中拍照與錄音，他有權力在我們離去前檢視所有的記錄
  - 爲了在訪問後我們能夠再確認您寶貴的意見，我們除了記筆記外還會在訪談進行過程中錄音與拍照。在訪談結束過後我們會讓妳檢視所有紀錄的資料，並會讓您同意後才將這些資料帶走。
- 說明所有的研究結果僅供學術研究，不會對外公開所有受訪者資料
  - 所有訪談的資料僅會作為學術研究之用，我們絕對不會公開您的資料，任何人都沒有辦法透過我們得知您的個人資料以及所有訪談的內容。
- 簽署保密協定（情況而定，若受訪者為訪問員熟識的朋友，或可省略此動作）
- 調整觀察與訪談的座位
- 準備錄音器材
- 盡量減少彼此的疏離感

## 二、進行訪談(105 mins)

### A.看受訪者挑選的照片 (20mins) (以下以個人為單位提問)

目的：了解受訪者在乎照片的哪些要素，怎樣的照片被認為是特殊的

- 請讓我們看看你挑選出來的五張照片。
- 當初我們請你挑選出五張「特別的」的照片時，你有什麼想法，打算怎麼作？
- 請你稍微介紹一下你選出來的 5 張照片。(為什麼選這幾張？為什麼認為它們是特別的？)  
(聽受訪者如何描述他的照片，並紀錄照片的內容)
- 在挑選過程中，有沒有什麼事情是讓你感到意外的，原先沒有預期到的？  
能不能描述一下你的感受？
- 家中有沒有其他與 這張照片 具有類似意義的東西？

### B.拍攝 (10mins) 目的：了解受訪者拍照的動機

每張照片分別是什麼時候拍的？請說明一下每張照片拍攝時的情況。

- 當時為什麼會想要拍照？
- 該張照片是用什麼拍照器材拍的？
- 有沒有什麼特殊畫面是手邊沒相機或錯過了拍照時機沒拍到的？有什麼感覺？
- 在不同的情況下你會使用不同的相機嗎？
- 你覺得使用數位相機跟使用傳統相機拍照有什麼不同？
- 曾經去專業攝影棚拍過全家福嗎？當時為什麼會想拍全家福？誰提議要拍？

### C.管理&瀏覽 (25mins) (以下以家庭為單位提問，受訪家庭中的每個成員都可以回答)

目的：了解受訪者如何定義一張/組照片、管理實體照片與數位照片的差異、瀏覽照片的動機

- 拍完照，你通常怎麼處理你的照片？什麼時候處理？為什麼？
  - 傳統照片：把照片拿去洗
  - 數位照片：傳輸到電腦裡，存在硬碟 燒成光碟 沖印出來
  - 手機照片：傳輸到電腦裡，存在硬碟 沖印出來
- 通常什麼時候整理照片？多久整理一次照片？
- 請讓我們看一下你們存放照片的地方 (數位照片：電腦裡的照片檔案位置)
- 這些照片是從什麼時候到什麼時候的？大約有多少張？
- 請說明一下你怎麼管理/分類你的照片，怎麼標註相本  
(數位照片：怎麼分類資料夾，怎麼命名資料夾)
- 會為照片命名嗎？請舉個例子。  
為什麼想為照片命名？
- 會為照片加上文字或圖畫註記(如大頭貼)嗎？請舉個例子。  
為什麼會想為照片加上文字或圖畫註記？
- 什麼時候會把照片拿出來看？時常這樣做嗎？為什麼會想看？  
有曾經特地要找某張照片的經驗嗎？能不能描述一下當時的動機和情形？
- 想找舊照片的時候，會有困難嗎？  
理想中的管理方式是怎麼樣的？
- 使用什麼軟體幫助管理數位照片？

- 有沒有什麼照片是存放在這個地方以外的？如：相框，畢業紀念冊，個人紀念剪貼簿等。  
為什麼這些照片會被挑選出來存放在其他地方？

**D.分享 (25mins)** 目的：了解受訪者分享照片的方式與動機

- 會想要跟別人分享照片嗎？(會不會跟別人一起看照片？)
- 什麼時候會分享照片？  旅行後  結婚典禮  拍到有趣的事物  介紹朋友給家人
- 常和別人分享哪些照片？可否舉個例子？
- 常與誰一起分享照片？  
有和家人一起看照片的經驗嗎？
- 透過什麼方式和別人分享照片？為什麼？  
 吸在冰箱上  將相簿/相框放在客廳  以電視播放，大家一起看  郵寄照片  
 以電腦播放，大家一起看  e-mail 照片  網路相簿  上傳到共同的網路空間
- 為什麼會想要跟別人分享照片？
- 在與別人分享照片的時候，會為照片加上文字或圖畫註記嗎？  
為什麼？可否舉個例子？
- 會把照片放到網路上分享嗎？ 目的：了解受訪者分享數位照片與實體照片方式的差異  
以什麼樣的形式分享？  網路相簿  網誌  網站  其他\_\_\_\_\_
- 那些照片會被放到網路相簿/網誌上？可否舉個例子？  
為什麼會想把照片放上網路？  
希望讓誰看到？  
使用哪個網路相簿/網誌？為什麼選擇這個空間？
- 會隨身攜帶照片嗎？為什麼？  錢包裡  存在手機裡  
曾經更換過隨身攜帶的照片嗎？
- 家中哪些照片會被展示出來？(如放在客廳)  結婚  全家福  祖先  小孩  結業  
這些照片分別被擺在哪裡？  客廳  冰箱上  書房  
照片擺放的位置有經過刻意規劃嗎？  
以什麼方式展示照片？  放入相框  貼在牆上  貼在桌前/放在桌墊下  
為什麼會想展示這些照片？  
曾經更換過展示的相片嗎？

**E.拍照器材 (10mins)** (以下問題以個人為單位提問) 目的：了解受訪者對拍攝器材的需求

- 請讓我們看一下你用的拍照器材。
- 當初為什麼會想買這台相機/拍照手機？
- 你認為這台相機/拍照手機有什麼優點？
- 你認為這台相機/拍照手機有什麼缺點？  
您覺得怎麼改善比較好？
- 如果你有一台萬能相機，你希望他能做些什麼？

## F. 討論現有相片相關產品 (15 mins) (圖片見下兩頁)

以圖片介紹以下現有的相片相關產品：

- 拍立得相機：  
以拍立得相機拍完照後，相機會立刻將照片印出，你可以馬上看到照片並與人分享。
- 大頭貼拍立得相機：  
除了印出來的照片是 ok 繃大頭貼，大頭貼拍立得相機與拍立得相機的功能大致相同。
- 無線網路數位相機：  
無線網路數位相機可連上網路，相機裡的照片可以直接傳到自己的電腦或是網路相簿上。
- 3G 照相手機：  
3G 照相手機不但可以拍照，還可以將及時將照片傳到其他人的手機裡。
- 隨身相片印表機：  
有了隨身相片印表機，不用去相館，自己在家裡就可以列印照片。隨身相片印表機體積小，並且有把手可以讓你提著到處走。另外，他還可以幫你製作自己的大頭貼照片跟磁鐵。
- 網路相簿：  
你可以透過網路相簿分享你的數位照片，並且很容易的為照片加上說明文字。
- 數位相框：  
數位相框裡可以儲存很多數位照片，而且可將照片以幻燈片的方式播放。
- 數位相片項鍊：  
你可以將你最喜歡的照片傳到數位相片項鍊裡，作為具有你個人風格的項鍊墜子。

與受訪者討論以下與上述產品相關的問題：

- 你覺得這些產品怎麼樣？
- 你對他有興趣的地方在哪？
- 你會怎麼使用這樣的產品？



## Photo Devices

拍立得(Polaroid instant camera)



izone 大頭貼相機





無線網路相機 KODAK EASYSHARE-ONE Zoom Digital Camera



3G照相手機 Nokia cameraphone N90



# Epson隨身印



網路相簿 <http://www.flickr.com>

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數位相框 Philips Digital Photo Display



Nokia Imagewear



## G.結尾 (10 mins)

- (請同行研究人員提問臨時想到的問題或先前未考慮到的問題)
- 是否有與照片使用相關的經驗並未含括在訪問內容中？若有，能否請你舉例說明？
- 訪談過程中有沒有哪些事情你覺得可以改變問法或作法會比較好，你比較能接受？這可以做為我們改進的參考。
- (請受訪者檢視所有記錄的文件並詢問受訪者是否同意我們帶走)
- (致贈受訪費及小禮物)
- 感謝你接受我們的訪問，若有任何問題或想到什麼想要告訴我們的，請聯絡我們。

P.S.以下項目須**拍照紀錄**：

1. 每位受訪者挑選出來的 5 張照片
2. 受訪家庭收藏照片的地方
3. 受訪家庭中被展示出來的照片(擺在客廳的相框,吸在冰箱上的照片等)  
(在原本擺設的位置拍攝)
4. 受訪者的相機,照相機,或其他與照片相關的裝置(如數位相框,隨身相片印表機等)
5. 受訪者標註照片的方式(相本側標 或 電腦資料夾/檔案命名)
6. 其他在訪問中被受訪者提到的照片

## 觀察後討論重點

訪談結束後，所有訪談人員儘快回想並討論，將重要的發現記錄下來，作為此一受訪者的側寫。

1. 拍攝照片的 6W1H (who, what, when, where, why, how, whom)
2. 管理照片的 5W1H (who, what, when, where, why, how)
3. 分享照片的 6W1H (who, what, when, where, why, how, whom)
4. 受訪家庭日常生活使用照片的頻繁程度如何？
5. 受訪家庭拍攝、瀏覽、分享照片的動機為何？
6. 不同的拍攝工具(傳統/數位/手機/其他)是否造成不同的管理,分享行為？
7. 採用特定拍攝、管理、分享照片工具的趨動力為何？  
受訪者對於拍攝、管理、分享工具的主要需求為何？
8. 數位照片與實體照片拍攝、管理、分享方式的差異？  
受訪家庭對數位照片與實體照片是否有不同看法？
9. 受訪家庭家中不同的成員是否分別有不同的照片使用行為？  
誰負責拍照？誰負責管理？誰只看照片？
10. 受訪者如何定義一張(一組)照片？
11. 哪些照片被認為是特殊的,有價值的？受訪者在乎照片的哪些要素？
12. 受訪家庭認為照片有哪幾種使用上的意義？他們利用照片來做什麼？
13. 其他發現