行政院國家科學委員會專題研究計畫 成果報告

建立居家生活脈絡與產品使用行為的關係模式(II)
研究成果報告(精簡版)

計 畫 類 別 ： 個別型
計 畫 編 號 ： NSC 97-2221-E-009-096-
執 行 期 間 ： 97 年 08 月 01 日至 98 年 10 月 31 日
執 行 單 位 ： 國立交通大學應用藝術研究所

計 畫 主 持 人 ： 鄧怡莘

報 告 附 件 ： 出席國際會議研究心得報告及發表論文

處 理 方 式 ： 本計畫可公開查詢

中 華 民 國 99 年 01 月 28 日

行政院國家科學委員會補助專題研究計畫成果報告

建立居家生活脈絡與產品使用行為的關係模式(II)

計畫類別：■個別型計畫　　□整合型計畫

計畫編號：NSC－97－2221－E－009－096

執行期間：97 年 08 月 01 日 至 98 年 10 月 31 日

計畫主持人：鄧怡莘副教授 國立交通大學應用藝術研究所

共同主持人：游曉貞助理教授 國立臺中技術學院多媒體設計系

計畫參與人員：黃可薰、周雨虹、陳炫劭

執行單位：交通大學應用藝術研究所

中　華　民　國　98　年　10　月　26　日

一、中文摘要

　　隨著近年新技術與新產品開發的蓬勃發展，遍佈運算的各項應用已在我們日常居家生活中成為必須且隨處可見的。當這些遍佈運算的產品逐漸我們的日常生活中普及並扮演重要的角色時，我們需要對產品在居家生活脈絡中的使用行為，以及其所牽涉的層面做進一步的了解，作為未來企圖以家庭為研究與設計場域時設計與研究團隊能有分析的基礎，幫助設計師做出產品的規劃。

　　本計畫第一年首先針對使用者在居家中生活使用產品與行為活動脈絡進行其行為模式的研究與建構，第二年則進一步探討當人造物介入其生活脈絡後，人們與人、裝置、環境等因素所衍生的互動及行為方式改變，透過前後活動模型的建構，分析並歸納在產品介入居家生活的情況下，使用行為所產生的變化因素與狀況。期望對於未來當新技術導入生活中時提供具體的知識和參考的基礎。

關鍵詞：居家生活脈絡；產品使用脈絡；使用行為模式；分析模式建構

Abstract

According to the flourishing technology and the well-developed product, the applications of Ubiquitous Computing have applied in our domestic environment. Based on field study, this research aims at developing an analytical model for studying context of use and user behavior in the domestic environment. In the first year of this study, contextual inquiry conducted to gather the general factors of behavior patterns and the attitudes of family members when they interact with artifacts and other people in their daily life. In the second year, we observe the difference of user's activity, interaction and the user behavior after the intervention of artifact for building and analyzing the reasons and factors behind. An analytical model of users context and user behavior was formulated to facilitate the investigation of new technology and design in other field in the future.

Keywords: domestic environment, contextual inquiry, behavior patterns, analytical model

二、前言

　　隨著科技進步與發展，電腦普遍進入我們的日常生活中，人們與資訊產品互動時間越來越長，這些產品並漸漸扮演著我們生活中不可或缺的角色。現今人機互動（Human-Computer Interaction, HCI）的研究開始轉向從使用者的角度，運用社會科學及人類學的研究方法，檢視使用者在生活中使用資訊產品的真實樣貌，使資

訊產品設計之初即考量如何適切的融入使用者的生活之中。

當資訊業者企圖將各式運算能力以遍佈運算應用投入家庭場域時，我們必須更為關注使用者在場域中的活動與使用脈絡，進行觀察與分析，了解使用者在活動中運用的方式，以及其功能與角色。本研究延續計畫第一年針對家庭中產品的使用與活動脈絡進行其行為模式的研究與建構進行，設計簡單的人造物並置入其生活脈絡中，觀察人們的活動、他們與周遭人、機、環境的互動以及行為方式的改變，並且透過分析在脈絡中，使用者與產品的互動與活動模型，深入了解涉入前後是否有變化，歸納比較在產品介入居家生活的情況下，整理討論影響使用者可能產生變化的因素與狀況。這個結果分析了居家環境中某些活動下使用者是如何調整與改變產品功能結構的分析框架與模式，幫助研究人員瞭解居家環境中，人們使用產品的行為模式與生活脈絡的關係。

三、研究目的

使用者產品互動時，往往依據行為目的而對這些產品的功能加以取捨運用，因為某些需求而調整產品的功能或加以做組合運用滿足活動的需求，這個活動進行的時空條件就是產品使用的脈絡（context）。在使用脈絡下，使用者才是產品功能的定義者，活動本身才是使用者關心的重點而不是工具本身。探討使用者進行的活動、以及使用者如何在這個活動中運用不同產品功能，有助於規劃以活動為中心的產品設計，以及規劃該產品可能互動的行為。

分析居家生活脈絡、產品使用脈絡以及產品使用行為，特別是以使用者從事的活動為基礎，分析在特定活動下使用者對功能的需求，有助於設計師思考未來遍佈運算進入家庭後所帶來的人機互動問題、安排更適切的互動設計，並更進一步地為使用者設身處地設想使用情境。此外，透過深刻的瞭解使用者使用脈絡也能幫助設計師與系統開發者盡可能地以生活脈絡為導向，將科技適切地導入使用者的日常生活之中。本研究的目的即為瞭解使用者在居家生活脈絡中的活動，並建立生活脈絡與產品使用行為的關係描述模式，

進一步將活動的研究與分析用以探究如何適切地將資訊產品融入使用者的日常生活中，幫助產品設計師，特別是居家環境中遍佈運算的系統設計師們做產品功能的規劃與應用。

三、文獻探討

McCullough 曾撰文探討脈絡與特定場域的相關性[2]。也就是產品的使用脈絡會依照不同的場域而有特定的樣貌。我們鎖定了家庭或居家環境生活中使用者的產品使用脈絡作為一種特定的研究對象，即已將之視為一種特定的生活脈絡來探討。

Venkatesh 教授所主持的諾亞計畫(NOAH Project)是第一個長期針對家庭運算科技進行實地調查分析的專案，從80 年代中期即調查美國一般家庭的電腦使用情況直至2002 年計畫結束，至今仍持續關注居家科技的相關議題[5]。他於一九八五年提出了一個說明居家科技結構的理論模式，在這個模式之中他將居家科技結構區分成社會空間(Social)、活動空間(Activity)以及科技空間
(Technology)三種。這三種空間彼此交互作用，而身處於居家的科技空間之中的工業產品對家庭成員也帶來了許多影響，其中包含了工具性對比情感性的影響、工作導向對比娛樂導向的影響、積極與消極的影響、單一功能與多功能的提供以及社會衝擊的強弱等面相。然而，若要深入探討產品使用脈絡與社會脈絡的關係，科技空間中的社會衝擊則有再繼續深入研究探討的必要。

Harper 等人從比較微觀的角度探討家庭內藉由人造物的流通所帶來的社會連結，企圖瞭解每一特定人造物對社會連結的影響[4]。他們運用人誌學的方法，探討傳統紙本郵件與家庭中社會組織的關係，藉以提出未來發展家庭中電子郵件工具的依據。

Crabtree 等人針對家庭中溝通的例行性活動發生區域進行民族誌調查，找出家庭中因為不同溝通活動、房間的擺設與規劃、活動進行的方式所聚落起來的區塊，將活動、家人之間的互動以及家庭溝通媒體的分佈區之間的

互動集散地分成Ecological habitats, Activity centers, Coordinate displays 三種區域[2]。這些區域是由於行動者所採取的行動與建築空間、物品擺設的交互作用所產生的行動累積效果。除了居家內部的結構探討，有些學者也關注居家場域透過科技的力量與外部社會結構連結的現況，說明居家科技輔助、增進或增生家庭外部社會組織結構的連結的現象。也說明了家庭生活脈絡與其他社會組織所形成的社會文化脈絡，某些部分亦因為科技的導入而產生新的社會結構[3]。

生活脈絡、產品使用脈絡以及人們使用產品的行為模式的交互作用下會影響科技的採用以及科技串連不同的空間的形式。生活脈絡之中包含了文化面、科技面、空間面、活動面以及角色面等。而產品身處在科技空間或者物質空間，扮演了媒介或延伸家庭成員進出社會空間以及活動空間的多重角色。
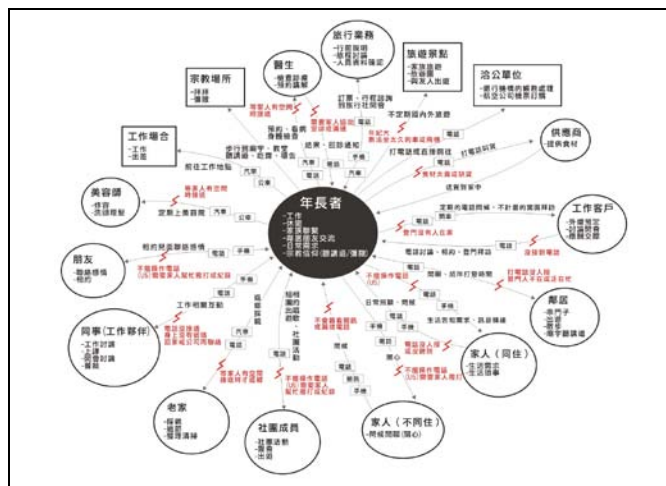
四、研究方法

在第一年的計畫中，研究以受訪者的客廳作為探索場域，藉由日誌、探針紀錄與脈絡訪查的進行，深入了解他們在客廳中發生某些活動中，生活脈絡與產品使用行為的組成因素，建構並整理出他們生活使用產品與活動的行為模式（圖一至四）。以此成果為基礎，在第二年計畫中，我們想進一步瞭解人們在科技的影響下所造成的新型態的活動方式與結構的改變模式。
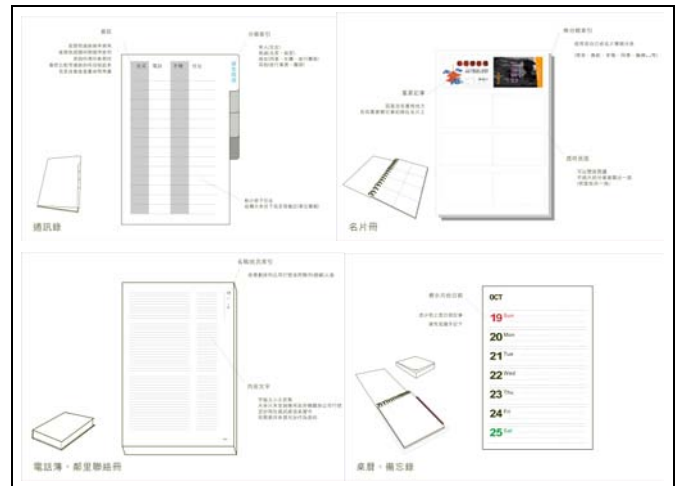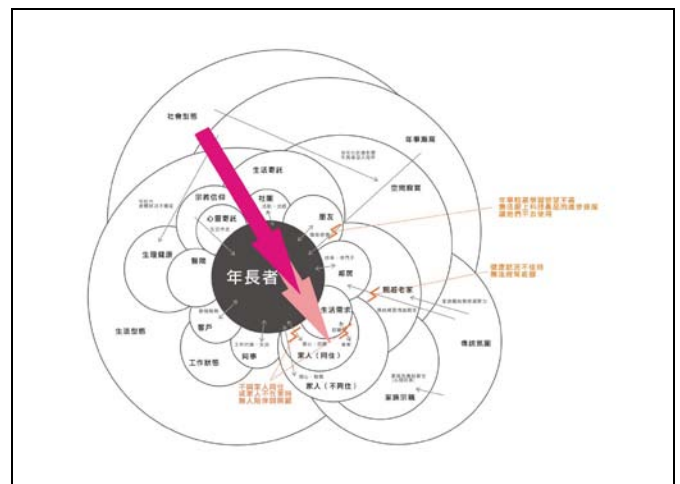

圖一、年長者居家生活之溝通脈絡

圖二、年長者溝通行為所使用之聯絡資訊
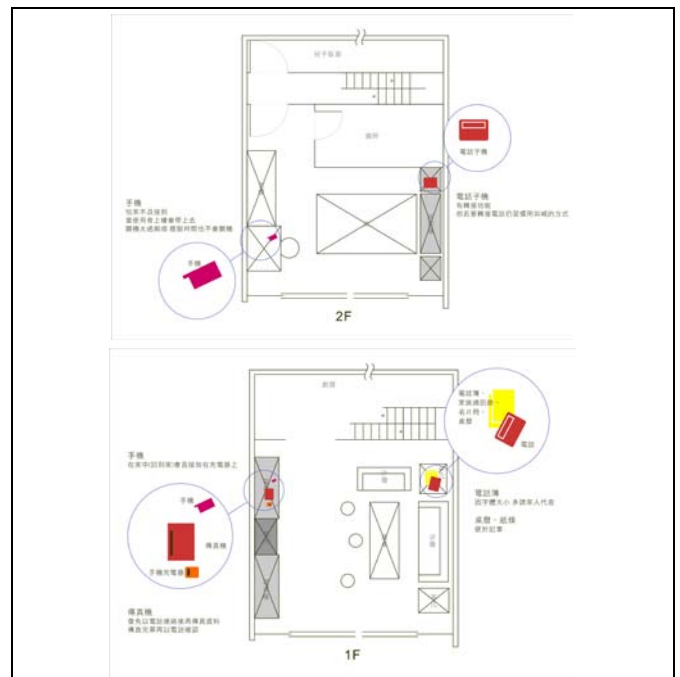
圖三、年長者通訊活動場域

圖四、影響年長者溝通行為之文化背景

本研究針對年紀54歲以上擁有不同生活型態的年長者在居家環境生活中溝通與社交活動的脈絡，為了觀察其媒體的使用互動與行為，研究依照他們的生活脈絡，在活動場域中置入人造物（artifact）後，觀察其生活型態的改變。

3

脈絡訪查（contextual inquiry）

研究分為兩個階段進行。第一階段首先就參與者分別進行脈絡訪查，核心議題包括年長者生活型態與背景、習慣聯絡對象與聯絡動機、使用溝通媒體項目以及溝通媒體之使用狀況等問題。脈絡訪查法本身即考慮了五種層面的議題：文化影響面、空間影響面、角色關係面、生活痕跡面、行動程序面[1]。雖然脈絡分析當初開發出來目的是作為研究工作空間的脈絡，並沒有針對其他場域。但是不辯自明地這五個層面在不同生活脈絡中都確實存在，因此運用脈絡分析的方法可以協助理解本研究所關注的居家生活脈絡。

針對想要研究的社交溝通的工具行為使用，我們分別進行各組受訪家庭之年長者居家社交行為與溝通之工作模式建立以及訪談分析，建立整合各個層面的工作模式（work model），以呈現溝通行為所牽涉的對象、溝通媒體、使用流程、使用環境、相關之溝通物件以及影響溝通行為之各種因素(圖五)。
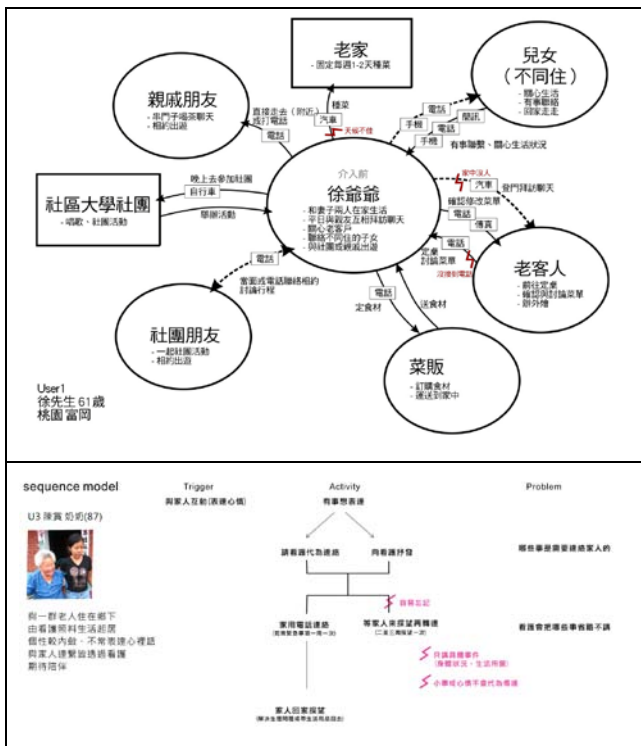
圖五、分析影響年長者溝通行為之各層面因素

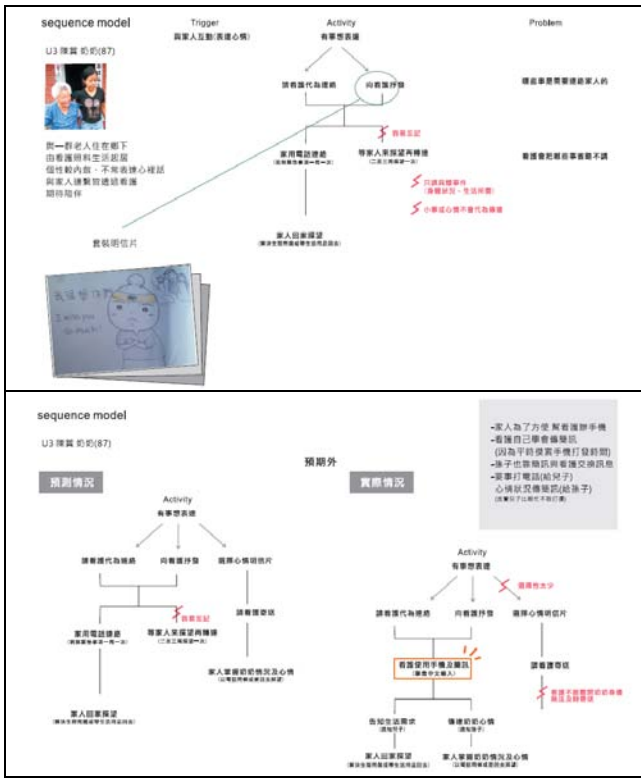## 居家溝通模式人造物探測

瞭解分析參與者的這些使用條件與因素後，在他們既有的脈絡下，我們分別規劃了三種類型的人造物於他們的生活中。針對僅使用手機進行撥打的參與者，我們設計了與朋友、家人等問候罐頭簡訊並指導他們使用；針對不會使用電話的

參與者，投入已經填寫好住址的心情明信片，指導他們在想與親友聯繫時委託鄰居寄送；針對使用網路的參與者，指導他們使用即時通訊軟體等。在投入人造物後四個月中，經由提醒與刺激鼓勵他們使用（圖六）。
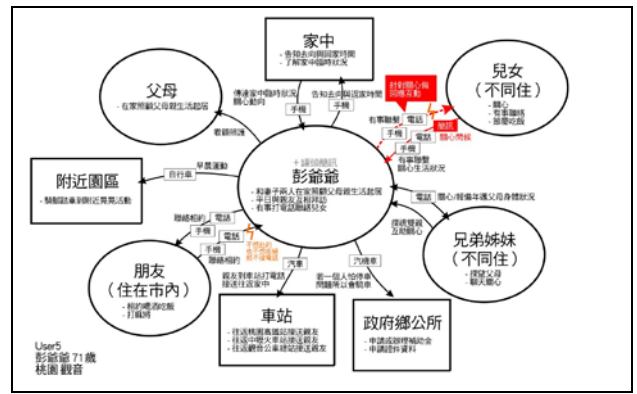

圖六、三種類型人造物，由上而下罐頭簡訊、心情明信片、即時通訊軟體

投入人造物四個月後，我們隨即進行第二階段的脈絡訪查。核心議題除了瞭解參與者對於人造物的使用情形外，觀察其生活脈絡的型態是否產生我們原先預期的使用變化，包括經過這段時間後，環境、物件以及對象的溝通行為的狀態等等。我們將結果建構成工作模式呈現，並與第一階段的訪查建立的工作模式分析與比較討論(圖七)。

圖七、年長者通訊脈絡預測情況與實際變化

五、研究發現

經由人造物置入的探索，以及兩個階段脈絡訪查的進行，針對年長者居家生活的溝通狀況建立工作模式（圖八）並做出分析比較後，統整歸納出以下發現，結果如下表。

使用者	預期中變化	未預期之實際變化
U1	1. 願意使用簡訊	1. 因簡訊轉寄功能附加其他資訊不敢傳送 2. 因女兒出國而開始使用網路電話及視訊 3. 使用書寫輸入方式克服不會注音
U2	1. 主動邀請好友加入MSN 2. 放棄資訊背誦記憶 3. 資料經由電腦彙整	1. 使用 e-mail 發送資訊 2. 改變群組分類方式 3. 公司禁止上班使用MSN等通訊軟體 4. 將資訊列印出來
U3	1. 能透過簡訊向家人傳達心理需求	1. 看護使用手機簡訊 2. 看護篩選訊息接收人 3. 明信片選擇性有限，無法表達情況 4. 明信片投遞困難
U4	1. 願意使用簡訊	1. 簡訊操作步驟繁複 2. 習慣以電話聯絡親友並寒暄
U5	1. 抗拒新工具的使用 2. 親友開始傳送簡訊	1. 簡訊只讀不發送 2. 不主動回應訊息

比較五個受測的使用者在接觸使用人造物後通訊行為脈絡預測的變化部分，探討預測其中改變及實際改變項目與其原因：

圖八、年長者原先通訊與投入人造物後資訊互動關係變化對照

符合預期的脈絡變化

符合預測的脈絡變化可分為 1.生活工具的演化、2.生活習慣與背景的改變、3.對身邊親友的影響等三個方面。分別說明如下：

1.生活工具的演化：帶給使用者更加便利的使用模式，如 U2 由於使用電腦後便不需再以背誦方式記憶資訊；U3 也因為新工具得以表達心理上的需求，不需等到會面時才傳達訊息。

2.生活習慣與背景的改變：則像是 U5 對學習新工具時較其他使用者有許多主觀的意見，亦提及自己對於使用簡訊的疑慮，因此即使學會閱讀簡訊，也不主動予以回覆。U1 與 U5 在了解使用操作簡訊後，考量到收訊者的使用能力與安全性，即便自己學會了使用這樣的工具，也不願意讓親友在使用上有任何的疑慮，寧可選擇較為保守或簡單的工具聯繫。

3.對身邊親友的影響：新的工具除了改變使用者本身，連帶的也影響周遭的人，U2 因為使用 MSN 的關係，極力邀請身邊友人一起加入使用，U5 也因訪談測試中幫他發佈了群組簡訊，對方認為可以使用簡訊溝通，使得親友有時會以簡訊問候，讓他們除了電話之外，還讓親友多了簡訊與他們的問候或聯繫的機會。

非預期的脈絡變化

比較兩階段的資料，歸納出年長者不同於預測的因素有下列六個方面：1.環境限制、2.操作能力、3.工具特性、4.生活需求、5.個人習慣、6.親友影響。

1.環境限制：U2 與 U3 分別因為工作環境禁止使用即時通訊軟體，以及看護無法抽身投遞明信片而

放棄使用新工具。

2. 操作能力：工具操作的問題也影響使用的使用意願，如 U4 由於手機本身的操作簡訊的方式過於繁複；U2 則是打字速度太慢而改以 e-mail 方式取代 MSN 即時通訊。

3. 工具特性：工具的改變，其中可分為新工具的「便利」以及「使用上的分群」，U3 即是由於簡訊的即時性及便利性而增加與親人交流的機會；U1 藉由手寫板與視訊克服不會使用注音輸入的問題而開始使用電腦通訊；而分群指的是如 U2 與 U3 使用 e-mail 與簡訊後所連繫的對象變為使用同樣工具的人。

4. 生活需求：生活需求影響了人們使用工具的方式，U2 使用 e-mail 分享新奇的事物，而由於朋友喜好不同影響她改變信箱朋友群組的方式。原先群組朋友以「場域分群」的概念，改以「共同興趣的朋友」作群組分類；而平時茶敘時經常會分享新鮮話題，所以使用者仍保留將資訊列印出來的習慣；我們對 U3 所投入的明信片選項無法完全貼近她的需求，降低使用者的使用意願。

5. 個人習慣：個人的性格與溝通習性也影響使用方式；在「個人習慣」方面 U4 因為個性開朗，喜歡聊天，所以放棄群組的簡訊傳送而選擇一對一的電話通訊可以達到連絡的目的還可以寒暄，較為親切；而 U5 因為脾氣較剛硬，不善與人交流，即使收到對方的簡訊也不會回應，所以訊息通常是單向接收的。

6. 親友影響：資料中有一項較為特別的，原本投入 U1 的工具為簡訊，但因為女兒出國而想與她保持連絡，所以學習使用視訊與即時通訊軟體。在其他的使用者中也因為我們投入的新工具，簡訊、MSN、e-mail 等而改變周遭親友的通訊模式。

六、結論

此階段研究中我們歸納了幾個使用者在選擇使用工具功能的重點：1. 外在限制 2. 心理與習慣 3. 生活貼合度。

使用者因為周遭的環境無法預期與掌握，他們會因為工作或生活場域無法配合而放棄使用；也會依聯絡的對象不同選擇工具甚至嘗試學習全新的工具，如親友出國促使其使用網路視訊；同時因為連絡對象類型的不同設立不同群組模式的

連絡圈，例如依照工作場域、興趣嗜好、所在群體等等。

參與者本身的個性與使用習慣造成選擇工具使用方式的條件，喜好與人互動的使用者寧願選擇慢慢的逐一打電話勝過有效率的廣播通知；也會因為生活中長久的生活型態而不願改變原本的使用模式，因為每天聚會需要而堅持除了把資訊以 e-mail 發送外也列印出來。

工具是否有貼近生活也是影響使用者選擇的一大要因，打字對年長者來說是一個很大的阻力，同時也為此抗拒使用簡訊以及電腦，但是若以視訊、語音、手寫等較貼合生活的動作為媒介，亦能使他們有學習使用的動力。聯繫通訊的對象亦是影響使用動力的很大角色，在某些目的使用下，他們必須進行工具的學習使用，目的與使用對象很容易輔助他們衍生最初的使用方式，原本定期的連絡交流也會因為工具的便利而轉變為頻繁，同時話題也不再僅止於具體的「要緊事」而衍伸至一般的話家常。

新工具的使用對於使用者而言不只是一個媒介，從中可以推測出他們的個性與生活型態；當然更要與他們的生活需求息息相關。年長者需要的不是功能強大的溝通工具，而是以原本習性為出發點考量、不侷限在特定平台與領域、亦不試圖區隔使用族群、可以涵蓋他們的朋友與環境。幫助他們生活中有便利有效的工具輔助操作，衍伸出沿著他們生活需求的使用脈絡。

七、參考文獻

[1] Beyer, H. and Holtzblatt, K. (1997), Contextual Design : A Customer-Centered Approach to Systems Designs, Morgan Kaufman Publishers

[2] Crabtree, A. and Rodden, T. (2004) Domestic Routines and Design for the Home. Computer Supported Cooperative Work: The Journal of Collaborative Computing, vol. 13 (2)

[3] Frohlich, D. and Kraut, R., (2002), The Social Context of Home Computing, in R. Harper (Ed.), Inside the smart home, London: Springer-Verlag. pp 127-162.

[4] Harper, R., Evergeti, V., Hamill, L., and Shatwell, B., (2003), The Social Organisation of

Communication in the Home of the Twenty-First Century: an Analysis of the Future of Paper-Mail and Implications for the Design of Electronic Alternatives, Cognition, Technology, and Work, vol.5, pp 15-22.

[5] O'Brien, J., Rodden, T., Rouncefield, M., Hughes, J.,
(1999) At Home with the Technology: an Ethnographic Study of a Set-top-box Trial. ACM Transactions on Computer-HumanInteraction 6(3) pp 282-308

行政院國家科學委員會補助國內專家學者出席國際學術會議報告

<div align="right">年　　　月　　　日</div>

報告人姓名	鄧怡莘	服務機構及職稱	國立交通大學應用藝術研究所
會議 時間 地點	2009/6/24~2009/6/26 法國/巴黎	本會核定補助文號	NSC 97-2221-E-009 -096
會議名稱	（中文）世界藝術人文與社會科學會議 （英文）World Congress on Arts, Humanities and Social Sciences		
發表論文題目	（中文）CrazyVote 網路組團現象--線上社群與真實生活中社會互動模糊的分野 （英文）Clubs Forming on CrazyVote - The Blurred Social Boundary between Online Communities and the Real World （中文）以勸誘科技影響並改變人的永續觀念 （英文）Influencing attitude change for sustainability through persuasion （中文）以設計而達成的共體驗 （英文）Co-experience through Design		

報告內容包括下列各項：

一、　參加會議經過

　　The World Congress on Arts, Humanities and Social Sciences 研討會，試著將跨領域的研究與觀點提供一個互相交流的平台，參與者包含了世界各國的研究者、科學家與工程師、學者，讓人文與科技能夠有機會彼此分享經驗和新概念，以及這些不同領域的近期研究成果，特別是讓人文和社會科學的關注帶到資訊科技領域中。

　　主辦單位 WASET（World Academy of Science, Engineering and Technology，世界科學、工程與技術學會），是一組織龐大的國際科技與工程學會，每年固定於世界各國舉行不同主題的研討會，讓各國學界的工程與技術能彼此分享其概念與發展成果。而今年於巴黎所舉行的世界藝術人文與社會科學會議，更特別將人文與藝術作為核心議題，並加入了社會科學與文化上的設計思維，以擴充目前科技與工程技術可能發展的面向之深度廣度。

　　本會議所包含的討論的議題有以下幾個類別（由於內容繁多以下例舉）：

一、電機工程與資訊技術

- 電子工程、電力與控制： Retention Pond, FPGA, Induction motor, PSIM, Voltage Controller, Hydraulic Machine, Hydro Electric Dam, EIA, ICOLD, Propulsion Mechanism, Elastic Wing, Field-oriented Control, Solar Power Generation, Voltage Drop, Cogeneration, PWM Inverter, Induction Motor, Fluid Force, MOSFET, Capacitance, High Field Stress, Charged Defects, ECG, Heart Rate Variability, Low Voltage Network, RR-inervals, etc.
- 環境工程：Factor Analysis, Garden City, Green Belt, Green City, Green Space Forests, Natural Resources, Pastures, Population, etc.
- 運輸：Sustainable Transport, Mobility Management (MM), Land Use Planning (LUP), Innovative U-turn Facility, Microsimulation, Travel Time, Unconventional Intersection Design, etc.
- 行動通訊：Mobile Agent, Mobile Computing, Partial Connection, etc.

二、資訊科技

- 訊號分析：Digital Signal Filtering, Machining Monitoring, Noise Cancelling, Sound.
- 人工智慧：Artificial Intelligence, etc.
- 資訊系統：System crashes, Hardware, Software, Security. Technology, Technological evaluation, Technology Maturity, Info-Works RS, etc.
- 多媒體(影像辨識、資料加密與壓縮等)：Finite Element Geometries, Data Fitting (head muscles\facial animation), Hash Function, Cryptography, Block Cipher, Message, Compression, Encoding, Tampering detection, Watermark Detector, Watermark Embedder, Watermark Message, etc.
- 認知與資訊設計：Cognitive Dissonance, Cognitive Psychology, Information Processing.

三、網際網路

- 網路工程與資料探勘：Non-linearity Internet, Networks, Process Mining, Process Similarity, Process Conformance, Neural network ensemble, 24-Hour Forecasting, Comparative study, Multi-unit auctions, Asymmetry of Information, Discriminatory Auctions, distributed generation, Reliability Indices, Data Analysis, Information, Communications Technologies, Expertise´Levels.
- 電子商務：Globalisation, ICTs, ICT Policy, Market return, Trading Volume, Access Management, Traffic Flow& Efficiency, Market Structure, Performance, Banking
- 網路行為：Hypertext reading, Herding Behavior, Prescription Behavior, Rational Prescription Thinking, Prescription Method, Virtual Environments, Second Life, Instructional Strategies and Technology, Contextual Inquiry Research Methods, etc.

四、人文與社會議題

- 教育：Illiteracy, Out of school, School Dropout Rate, Socioeconomic Determinants, Scholarly Communication, Collaboration, Knowledge, Classroom.
- 多元文化：Disciplinary Culture, Networked Information of Arab World, Cross Culture.
- 政治與 e-Government 議題：Hobbes, Eloquence, Opinion, Science Policy, Civil Obedience, Politics, Liberalism, Ideological Control.
- 社會互動議題：Social Computing, Social Interactions,
- 設計：User-centered Design.
- 其他：Anaerobic Oxidation, Microbial Fuel Cell.

6/24 前往大會報到，完成現場註冊、領取論文集、光碟和場次表。

6/25 參與學生的論文口頭發表過程；並參加多個場次的埨文發表

二、 與會心得

　　本次研討會所來自各國的學者非常多，在參與的過程中，有相當多的機會與不同國家的學者進行交流與討論，尤其以往較少接觸的中東、亞洲，以及北歐等地的學者。此外，除了有本所學生們三篇不同主題的報告，另外於會場也遇到來自於台灣的環保署、成功大學、逢甲大學、屏東科技大學等學生，能知道國內外各領與所關注的核心議題以及科技發展面向，實為一非常難能可貴之經驗。

　　研討會時間為期三天，6 月 24 日至 26 日，其中有逾百篇來各個領域的研究發表，內容之寬廣與以往所參與過的研討會相當不同，綜合了電機工程領域、網際網路與資訊科技、以及人文社會與設計研究議題。有機會分享與了解不同領域現階段的技術，對於日後在學術思考的廣度上相信會有一定的幫助。

　　然而這次研討會的主辦單位，於發表的論文議題上並沒有做最完善的考量，在同一會議場次中可能綜合了非常不同領域的研究報告，因為發表者的領域差異性過

大，也使得各學者發表後討論時間問題的深度受到限制，也使得聽眾難以選取某特定議題的場次來參與。除此之外，所分配的口頭報告時間也因為各場次的主持人而有所不同，亦即並非所有的發表者都能享有同樣的時間，由於這種時間安排上的鬆散，想旁聽的與會者也沒有機會掌握想聽的論文發表時間。在會議期間亦發現，部分主持人是於報到當天方才獲得自己所主持場次的所有論文之資料，這使得許多主持人難以介紹和掌握場次的研究內容，這些缺失是該學會於法國的主辦單位應當檢討的部份。

三、 建議

　　綜觀此研討會，與會的研究學者眾多，並來自於不同文化、國家，的確提供各國學者有良好的機會理解和認識他國的研究方法和思潮。然而由於研討會的議題過於寬廣，使發表之論文也相對的龐雜、繁複，並使得參與者不易安排適當的參與議程。另外一明顯的特徵是，亞洲的參與者，尤其是台灣，較沒有勇氣於會議中參與討論、發表自己的想法和意見，這使得學術交流的機會大為減少。在發表後的討論過程中，能更深刻的感受到來自歐美以及印度、中亞的學者，就算所屬的領域與發表論文議題不盡相同，也會對於發表者的研究方法、過程內容，提出適當的疑問和建議、鼓勵，我想這是所有參與研討會的人最希望獲得的經驗分享，也是最有價值的地方。或許台灣在未來教育學子的過程中，應當更鼓勵學子勇於發問、參與課堂討論。

四、 攜回資料名稱與內容

1. 研討會之論文集，部分之書刊（該研討會將相關的論文以二十篇左右為一單位印製，因此只獲得收錄自己發表論文之部分論文集）。
2. 研討會之論文集，完整 CD。

五、 其他

Clubs Forming on CrazyVote - The Blurred Social Boundary between Online Communities and the Real World

Ko-Hsun Huang, Hsiao-Chen You, and Yi-Shin Deng

Abstract—With the rapid growth and development of information and communication technology, the Internet has played a definite and irreplaceable role in people's social lives in Taiwan like in other countries. In July 2008, on a general social website, an unexpected phenomenon was noticed – that there were more than one hundred users who started forming clubs voluntarily and having face-to-face gatherings for specific purposes. In this study, it's argued whether or not teenagers' social contact on the Internet is involved in their life context, and tried to reveal the teenagers' social preferences, values, and needs, which merge with and influence teenagers' social activities. Therefore, the study conducts multiple user experience research methods, which include practical observations and qualitative analysis by contextual inquiries and in-depth interviews. Based on the findings, several design implications for software related to social interactions and cultural inheritance are offered. It is concluded that the inherent values of a social behaviors might be a key issue in developing computer-mediated communication or interaction designs in the future.

Keywords—Social Computing, Social Interaction, User-centered Design, Contextual Inquiry.

I. INTRODUCTION

ON account of the rapid expansion and improvement of information and communication technology, the Internet has played an irreplaceable and dominative role in online users' social lives in Taiwan like in other countries. The accessibility to various emerging communication media has changed not only online users' living contexts but also their interpersonal relationships. These developing technology applications both support new platforms for communication and offer numerous possibilities for an unprecedented increase in social interactions. There are now a variety of new social communities, virtual and physical [1][2].

In the past twenty years, information technology applications have been developed and redesigned for different purposes. Some unexpected forms of social interaction and other side effects have emerged which have slowly been adapted and incorporated into people's lives [2][4]. For instance, the main functions supported by weblog have changed from traditional information disclosure to information sharing and exchanging. Besides, the development of community diaries and collaborative blogging present evidence of rich sociality and communicative competence [5]. In fact, personal on-line diaries not only serve as a means to record one's experiences and express one's emotions, but consequently also reflect one's attitudes and expectations toward society as a whole and in relation to one's cultural context [6][7].

In the related research fields of HCI and CSCW, it has become of great importance to comprehend the complex social interactions that take place in a real context in the online communities [8][9]. The extensive discussions of web 2.0, social software and social computing, also focus on the relationship of technology, interpersonal contact, and social communities. Individual social attitudes also rely heavily on one's social context and cultural background [10][11]. Hence, the fundamental issues of technology media or online application development have extended from general usability problems to wider social aspects of interpersonal contact, information sharing, participation and culturally inherent needs [12]-[15].

In this study, it is fully explored that the teenagers' social activities on the Internet are inherently embedded in their real life context. Therefore, a case study of unexpected phenomenon on a social website, teenagers' voluntarily club forming, is presented. The study applies user experience research methods, which include practical observations and qualitative analysis by contextual inquiries and in-depth interviews [16]-[18]. These methods could reveal different characteristics of personal perceptions, values and requirements in relation to the overall social context. Additionally, the potential design implications for social interactions based on the findings are also addressed.

A. Teenagers' Lifestyle in Taiwan

In Taiwan, the children are expected to study hard since they get into a primary school. Then teenagers in junior or senior high schools even study harder. They have to study from 7a.m. to 5p.m. at school Monday through Friday. If they are lucky at school which allows its students to take an hour a week to join extracurricular activities, they must be in very high spirit. However, the chance is very slim especially for senior high

K. H. Huang is with the Institute of Applied Arts, National Chiao Tung University, Hsinchu, Taiwan. (corresponding author to provide phone: 886-3-571-2121; fax: 886-3-571-2332; e-mail: kohsun@csie.nctu.edu.tw).

H. C. You is with the Department of Multimedia Design, National Taichung Institute of Technology, 129, San Min Road Section 3, Taichung 404, Taiwan (e-mail: hcyou@ntit.edu.tw).

Y. S. Deng is with the Institute of Applied Arts, National Chiao Tung University, Hsinchu, Taiwan. (e-mail: ydest@faculty.nctu.edu.tw).

school students because a senior high school takes it a responsibility to help its students prepare themselves for getting into a university with a fine reputation. Matter-of-factly, senior high school students are under the academic competition pressure and for them university education is a top priority. After school, most parents also spend extra money sending their children to a cram school to learn more. Due to the tight schedule, making friends for them is to find friends from their classmates. However, there is no room for teenagers to have social activities with others.

The only fun the teenagers might have is to get on the Internet to surf the websites if they can steal some time at home after the long-hours studying. No doubt the majority of the teenagers in Taiwan are happily to be able to get on the Internet as often as possible. On different websites, the teenagers give themselves freedom to explore things new or challenging. However, parents do not approve their children, who are supposed to concentrate on school work, to have a face-to-face gathering with an online pal. Besides, they believe it might expose their children to risk especially when they are not companied by a reliable acquaintance. It is generally believed that online pals might hide their real identities.

B. The CrazyVote

CrazyVote (CV) is a project for efficiency-evaluation of a technology company in Taiwan (Fig.1a). For system testing, it is designed as a web-based social platform, which provides teenagers personal web space to easily access, including diaries (blogs), photos, and personal message boards.

Fig. 1 (a) CrazyVote website (b) Admirer list

The major characteristic of the CrazyVote is the appreciation of others' photos. It is different from regular on-line photo albums. Its rule is that a user can post only one photo on the CV, for the advantage of enabling users to browse all the photos of others in a short period of time. If the photo of a user is appreciated by others, who will give it a point ranked from 1 to 10, and 10 point means that the photo is the most admirable. The identity of the admirer shows when a high point arrives. Hence, the user is able to give a point back to that admirer about how he or she appreciates the admirer's photo too (Fig.1b). To rank others photo with a simple click and to notify users of where the praise comes from make CrazyVote very unique. The

simple interaction promises that one can definitely come into contact with others easily.

In addition to the space for users to write their diaries, bulletins and the name list of good friends, users can also share the information of their life context. *The Map: Where Users Live* shown in Fig.2, reveals how close those young users live to each other. It makes those who live not far away from each other have more local topics and experiences to talk about and to share. That makes the CV totally different from other websites too, and then the localization and familiarity do deliver young users a possibility of making an online pal ending up a friend in reality.

Fig. 2 The Map: Where Users Live

In 2008 summer, there were more than 25,000 young people registered on CrazyVote, and it became the biggest social website for teenagers in Taiwan. Not surprisingly, 55% of the CV users were senior high school students while 24% are freshmen and sophomores. The main reason for its popularity is that online pals can be real, safe, cool, simple, easy to chat and interact without age differences because users are mainly between 16 and 19 years old, and they are the original target users of the CV. During the summer vacation in 2008, some of the CV users take an action voluntarily to recruit some users to have a face-to-face together and turn the online interaction among users into reality.

C. Cultural and social context in Design Issues

People interact with others through many social cues, including those determined by facial expression, eye contact, gesture, tone of voice, and temperament. In common ground theory, it is suggested that people are constantly checking these social cues to make certain they are attaining mutual understanding. A shortage of social information will have a direct impact on communication [2][19]. By referring to the theories of social science, many studies have dealt with the importance of social concerns in technology developments [20][21]. However, social issues are fundamentally related to cultural dimensions. In different cultures, people's social activities, common understanding and needs are naturally not the same. In other words, the social issues emerging from interaction and interface design also represent the influence of contextual and cultural differences.

Since social context is one of the most important issues, understanding the culture that sustains a whole society is a must

for interaction design. Most studies, whether of usability problems or commercial issues of localization, all reveal the importance of cultural effects by inductively analyzing and categorizing the interfaces of existing online applications that show usage bias [13][14]. However, these studies do not take into account inherent cultural background and the results can be applied only to redesigning or amending existing interfaces.

As social issues arise in science and technology development, cultural causes and effects have been discussed extensively in different fields and some researchers have tried to apply anthropology theories to the design process. However, these theories and findings sometimes range over many complex categories and are too detailed to translate into design guidelines. Nevertheless, the qualitative research methods of the social sciences, such as ethno-methodology and narrative inquiry or narrative research methods, are still essential for investigating the obscure connotations and inherent motivations behind users' behaviors, and for helping designers to comprehend cultural context.

Not only functionality and usability, but users' attitudes toward technology should be deliberated in the technology design process. In addition, people's behaviors, customs, motivations for usage and perceptions are all strongly influenced by their social and cultural context. To inspect whether the services and interactions provided by science and technology truly match users' social needs and expectations, it is necessary to examine what role emerging technologies might play and what effects they might have in real context.

In this research, a thorough investigation of teenagers' voluntarily club forming through a social website is conducted to present the ideas of identifying the abundant cultural features in their on-line behaviors and attitudes towards friendship and interaction. Understanding of teenagers' perspectives about and needs of friendship might offer to enrich computer-mediated communication or information designs in the future.

II. METHOD

The administrator of CrazyVote (CV) web service noticed that during the summer in 2008 there were more than hundred users using the same titles as *Saint*, *mdc*, and *CHIV* in front of their account names. The administrator, therefore, made an inquiry into such a phenomenon and then disclosed that parts of those users had formed their own on-line clubs voluntarily on CrazyVote website.

To investigate the club promoters' motivations and the members' perceptions, user experience research methods has been applied to this research, which include practical observations and qualitative analysis through the use of contextual inquiries [16][22]. In order to distinguish the significant meanings of clubs forming willingly, nine active website users were chosen in this study (see Table I). Seven of the subjects had different positions in their own club, including three founders of the distinctive clubs and four club members. The others were two regular website users, who socially visited

online but did not join any clubs. In addition, there were another forty club members and forty regular users selected at random. All of the eighty subjects in the sample already registered on CrazyVote more than half a year, and got on the website actively at least once a week. Hence, the two groups were selected to examine if their online social behaviors would have changes on account of clubs forming.

TABLE I
RESEARCH SUBJECTS

Subjects	Club Member	Regular User	Total
Contextual Interview	7	2	9
Online Behaviors Analysis	40	40	80

For attaining a thorough understanding of club members' perspectives and attitudes towards an online community and their actual social activities, in-depth open interviews were then conducted. The field date-gathering technique based on anthropology and ethnography are also applied to observation of the entire process of online social behaviors. All the data derived in the research were decoded into an affinity diagram to explore the significant meanings of club forming and to present the important design issues related to online communities.

According to the results of in-depth interviews and contextual inquiries, the enhanced cultural model (Fig. 3) was constructed to show that teenagers' club forming phenomenon is triggered and influenced by their present motivations and permanent cognition and attitudes toward online social activities. This model articulates several components with the key issue how cultural context and current social trend influence the overall activity. The model Participant(s) indicates those that have involved in the activity, representing either a single person or a set of people with similar motivations and attitudes toward the social activity. Interaction represents interpersonal contacts and communications, or people's actions upon the artifacts and environment of the activities. As shown in the Fig. 3, expansion of information and communication technology influences that the young generation have flexible communicating abilities to apply diverse platforms and to form their online friend-making processes. In addition, there exist social issues of meeting online friend which encourages them to form a unique network to ensure the true identities of their online friends and to develop the confidence in each other in reality (more details on this will be presented in the section of discussion).

By integrating the results of interviews and the simple comparisons of online activities between club members and others, the detailed description of teenagers' social behviors, purposes and requirements is given in the next section.

III. FINDINGS

The main issues examined in the research comprise the overall context of teenagers' online social behaviors and relevant activities at present. The results of interviews have been interpreted, analyzed, and categorized through a strict qualitative process. This section offers a complete presentation

of the club forming phenomenon, including the reasons of forming voluntarily, club structures, teenagers' social relationships and activities.

their personal information, started to chat with each other through MSN and Yahoo messengers, and held several different actual activities.
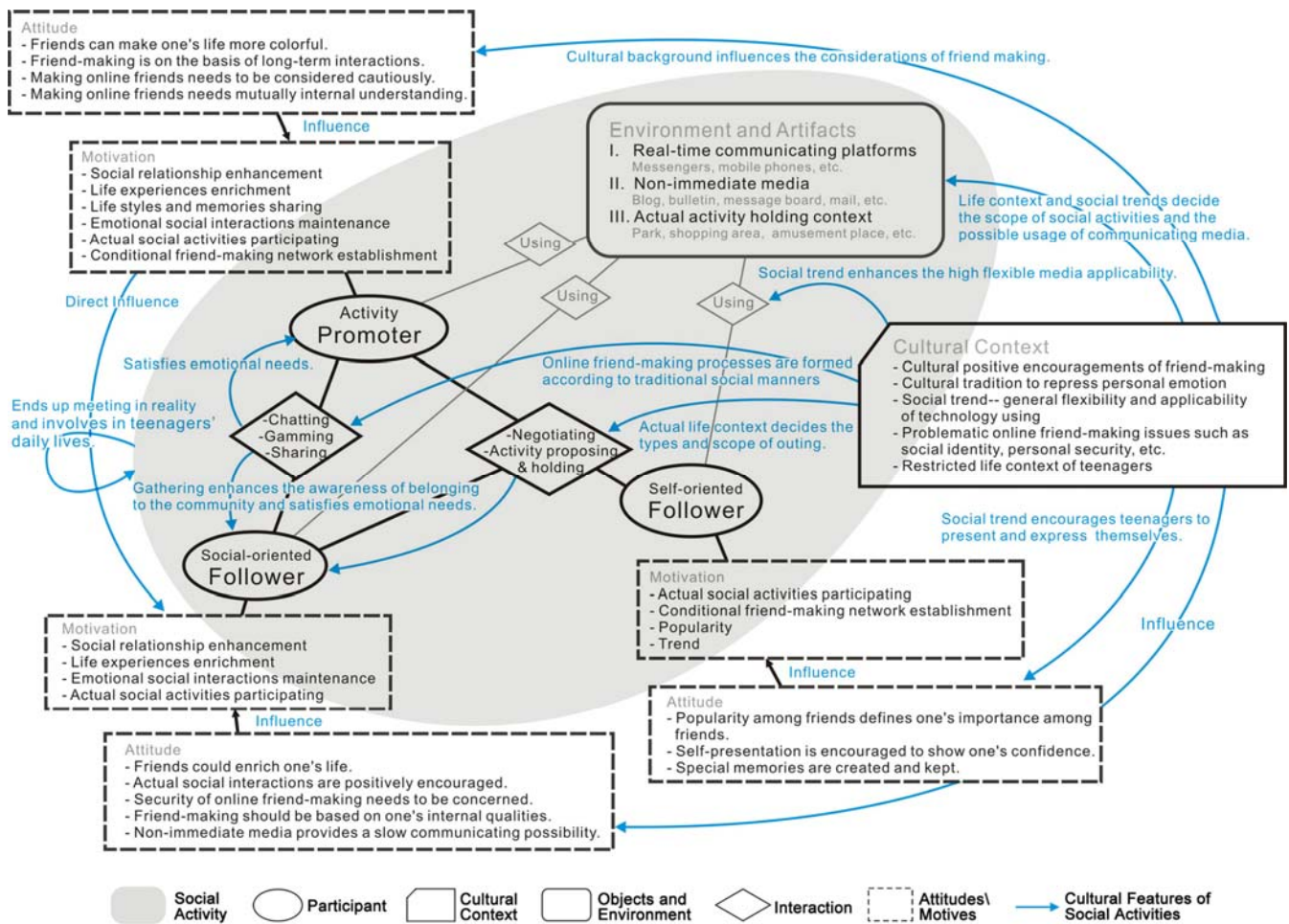

Fig. 3 An enhanced cultural model for teenagers' club forming phenomenon

A. Clubs Forming on CrazyVote

Three distinctive online clubs were formed continuously during the summer in 2008. All the young promoters have their own definite purposes and reasons to make friends, which indeed represent teenagers' perceptions and needs for their social life.

1) Having more actual social activities with on-line pals

The first club is named *Saint*, which was formed by a 19-year-olded user, Pz. He wanted to make a team or a gathering with other CV users to do something interesting, new or different.

In the beginning, Pz and his roommates added *Saint* in front of their CV accounts for the sake of a special identity to show their close friendships. In July 2008, he thought it might be cool to put into action to post the idea on his own blog to recruit other users to join them and form a club online. A few days after that, about fifty users were happily to join his on-line club, and entitled this club "*Saint*." The club members exchanged

2) Making congenial friends by restrictions

Following Pz's step, other users started to form their own clubs for different reasons or purpose. A distinguishing club, *mdc*, was named after the initials of its three promoters and was set up for a clear purpose for making a circle of friends who must be congenial to each other one way or another.

The *mdc* promoters made a request that their members must have some qualifications. For example, a club member's score has to achieve 9000 points (which are ranked by other CrazyVote users) and there must be more than 20 users on his or her own friend list. The exacting restriction also reflects that the club founders expect their members already have logined in CV website at a certain time and are very enthusiastic about making friends with others. In addition, the membership of *mdc* club is limited. The club promoters select a few members each time, and even give a thought to the gender ratio while recruiting.

3) Removing limitation with understandings

Since August 2008, another club *CHIV* has appeared on the website, which has no restrictions on member recruiting. At the

same time, the *Saint* club became more and more well-known among teenagers, and the number of the club members quickly soared to one hundred. However, Pz and several core members decided to excluded the club members from their club to manage the club successfully, who hadn't joined in their online meetings enthusiastically.

A young girl then decided to form another club open to every user without restrictions, since many of her friends who might not be able to join club activities regularly had been excluded from *Saint*. It declared that *CHIV* means 'Hi, all CV users.' It allows those who are eager to join such clubs do not have much spare time interacting with others on the Internet, but do hope to be a member of one club.

4) Sharing and communicating within different clubs

With different club promoters' characteristics and rules, the style of each club seems unique and the main social activities of each are different from each other. For instance, the members of the *Saint* club are fond of music and outing, while the members of club *mdc* enjoy playing online games. Most of the promoters not only ask their members to participate in club activities to the utmost, but also encourage the members to partake in other clubs' outings. The following quotation collected from an in-depth interview and translated into English offers explanations about the benefits of various web clubs.

> *It's nice to have different clubs on CV... Because the characteristics of each club are different, that allows us to have opportunities to learn something new from each other by exchanging views and experiences. It seems that if the members of another club are style-conscious, we can learn it from them how to dress ourselves. And maybe, we can share something special with them too. On the contrary, if we all join the same club, we might be assimilated into a way without characteristics and might not learn anything new... (A. In-depth interview. 27 August 2008, translated from Chinese)*

Even though the styles of these clubs have no resemblance between each other, the main purpose of forming clubs is the same, having fun. In general, these club members are teenagers who are enthusiastic about making more friends with common interests and similar lifestyle. On CrazyVote website, the young users have developed their own ways to extend their social circle.

B. Roles and Organization

The average number of core members in each club is about 30, and the biggest one, *Saint*, has about 50 at present. To communicate with the others and hold club meetings successfully, teenagers develop their own club organization structures for sharing labor work. These positions include a club leader (chairman), publicists, managers, and chapter leaders.

1) Leaders: coordinated all interactions among members

A club promoter usually acts as a leader, who has the authority to accept or to terminate a club membership. In addition, a leader has to administer online meetings, to bulletin all information, and to make the final decision of club activities.

In the clubs, the elder members also take some kind of duty. The ages of club members are mainly from 16 to 19 years old,

and the small difference in age could make huge diversities of opinions, thoughts and attitudes. The elder members often play the role of mediator, trying to pour oil on troubled waters and making things right. In addition, the elder usually not only have better organizational competence but also provide leaders with more appropriate advices to handle the club activities.

As a leader, the most important task is to coordinate all interactions among club members. In an interview, for example, an interviewee mentioned that several club members were harassed by someone, who persistently abused the online messenger to broadcast personal information to others. After the annoyed members appealed to their leader, the leader expostulated with the troublemaker on his ungracious behaviors.

2) Publicists advertised clubs and recruited members

To expand the club efficiently, teenagers knew how to use marketing strategies. They chose several members to serve as publicists, who had to advertise and canvassed more CrazyVote users to join their club. However, these publicists were not in charge of approbating the applications of admission to the club.

3) Chapter leaders held the regional activities

On account of different districts or locations, the clubs are separated into several chapters in the north and in the south. As general social networking sites, online pals might live in different places throughout Taiwan. Even though the club members want to hold some actual activities and turn the virtual social contacts into face-to-face gatherings, teenagers encounter the problem due to distance and the cost of money. In Taiwan, most parents hardly allow their children especially under 18 years old to take a journey to a distant place with on-line friends. That is the reason why the club members are compelled to hold the regional activities such as a short-distance outing. Therefore, north chapters and south chapters are gradually formed in the clubs. The chapter also has its own leader and managers to hold activities.

In the study, most interviewees were proud of being a member of their clubs, and they also described that their clubs are managed like enterprises, which have a clear destination to enhance members' social relationships and definite organization structures for work sharing to continue and to enlarge their clubs.

C. Club Activities

After joining a club, the members started to have frequent contacts with others. With common characteristics, such as habits, entertainment, or lifestyle, club members started to hold different social activities.

1) The process of holding activities is complex but effective

To conduct a club activity successfully, these teenagers show their flexibilities to access different web-based communicating platforms. The process of holding an activity includes proposing, discussing, and bulletining the final decision.

Firstly, a proposer writes an idea in his\her own blog, and asks club members to second the motion by leaving a message. If it is generally supported, club members would start to discuss

the details, such as when and where to manage an activity, through online chat room or messenger. Later, the club leader or activity promoter will collect and sort all suggestions for the members to choose their favorite one through the voting system on the Internet. The final decision will be bulletined on Club's official site and in the club leader's CV blog, which is made a final check to confirm who will participate to put the idea into action. In this case, the entire process of planning such an activity does not take a lot of time since all will be done on the websites.

2) Club activities are cohesive and diverse

Club members make arrangements for varied outdoor activities, such as going to a theme park, shopping, and singing at KTV (karaoke house in Taiwan), and they also develop their own online culture, like forming a small group to play online games or to chorus on Yahoo messenger:

We...about 20 to 30 members of our club...are very close now. There are more than ten members who participate in outdoor activities from time to time in Taipei...(B. In-depth interview. 27 August 2008, translated from Chinese).

We chat online every day and talk about everything. We play guitar and prepare our own music accompaniment to sing songs together on Yahoo IM Conferencing...Some people chat, some people sing, and some people request songs. It looks like sort of online KTV (A. In-depth interview. 27 August 2008, translated from Chinese)

Having leisure activities, these teenagers are also promoting the image of their club, and trying to make all club members feel close to each other and like to belong to the club. As shown in Fig. 4, they held a badge design competition for the club, and proposed to use the first design to make their own uniforms and peaked caps. Furthermore, they decided to write a song for the club:

Most of our members can make the animated GIF pictures, and we designed many logos as club badges.... There are no specific rules in our badge design competition. However, we set the prize that we will apply the winner's graphic design to make our uniform, a T-shirt probably, and the winner will receive a free one (A. In-depth interview. 27 August 2008, translated from Chinese).

Fig. 4 A badge design competition of club *Saint*

In the foregoing section, it is mentioned that the distance for teenagers causes the clubs to separate north chapters from south chapters. The regional differences, therefore, are reflected by the club members' subjects, attitudes, habitual behaviors and the type of usual social activities. Most interviewees consider the members in the south of Taiwan are much more native, enthusiastic and active, even though the members of north chapters are more. These south chapters have held a lot of small-group activities by themselves, and they are fond of sharing the wonderful experiences to others by posting the travel notes. In fact, the frequent outings encourage more club members to join such actual social activities.

D. Social Contacts of Club Members

If Teenagers want to make more friends and have actual social interactions beyond the virtual online community. At the outset, the members congregate in the online chat room to discuss the time and the place to have a get-together party. Having common topics gradually increasing, the group talk continues every day and makes club members more familiar with each other. They care for each other and have established ties of comradeship.

In addition, one of the interviewees even believes that the club he belongs to is just like a big class, where students are very keen to know their classmates. The sense of belonging of an organization itself brings natural relationships among the members.

Before clubbing, I logined CrazyVote every day, but do nothing special...But now, there is a sense of belonging, and I have more motivations to visit here. I know I have a lot of friends, right here (C. In-depth interview. 27 August 2008, translated from Chinese).

I post something innermost in the blog...They (club members) may encourage me or respond to it with a message, which is very worth reading...It is some kind of attachment... (E. In-depth interview. 27 August 2008, translated from Chinese).

The club members have more interactions than those who do not join the club. In the study, 80 active users who regularly visited CrazyVote website were selected and their general online activities have been recorded. Half of the subjects are members of one of the clubs, and the others are ordinary users who are active on-line but do not join any club. In Fig. 5, the light blue line shows how many CrazyVote users there are that a club member interacts with in his\her own message board per day, and the dark blue line indicates the number of users that an ordinary user interacts with. As shown in the figure, those who join the clubs make friends faster and easily and then attract more users to visit their message boards. Since the first club *Saint* was formed in the beginning of July, the average of users each club member might interact with has increased obviously. In Fig. 6, the light green line shows an average of users who visit a club member's blog per day, and the dark green line indicates an average of users who visit an ordinary user's blog. Since clubs were formed, the average number of users who might share their sentiments on a club member's blog has increased from 3 to 13.

The sense of belonging also makes club members try to strengthen their own club like a small society. Leaders encourage members to participate in club activities, and members try to build the image of their own club by making the badges, uniforms and songs. They browse friends' CV blogs and message boards every day to make sure that they do care

about friends' daily life. However, most leaders soon figured out that it is difficult to have all members stick to each other. In the interviews, an elder interviewee said:

After the summer vacation, everyone will become very busy...Maybe two or three years later, these senior high school students will grow up, and it will be easier for us to map out some activities. I think it is worthwhile to expect... (A. In-depth interview. 1 September 2008, translated from Chinese)

Most club members are students and have to put a lot of effort to study, especially for senior high school students at the ages between 16 and 18. In Taiwan, parents do not allow their children travel alone to a distant place and make some restrictions on children's social behaviors due to protection. Accordingly, the participation of club activities depends on several important factors such as age, region, money, (school) work and lifestyle. As the previous paragraph mentioned, the leader of *CHIV*, who did not ask her members to get online continuously, confronts this situation firstly.
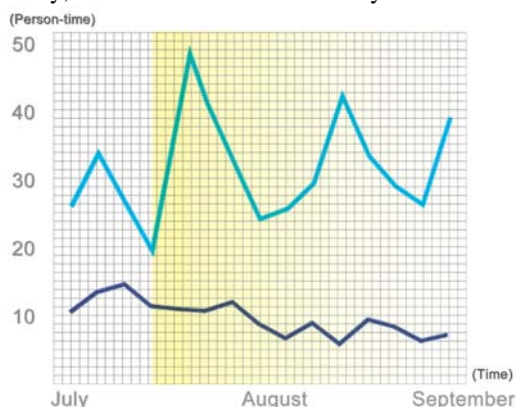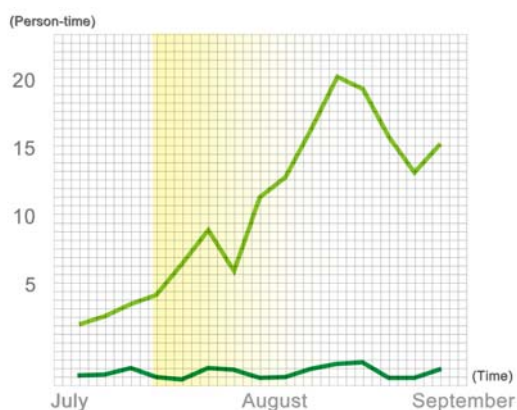

Fig. 5 Interactions on message board

Fig. 6 Interactions on personal on-line diaries

IV. DISCUSSION

Based on interpretations of the interviews in the case study which have explored teenagers' social behaviors and attitudes towards the on-line clubs, it indicates a teenagers' significant social model on the Internet in Taiwan.

First, the teenagers' considerations of making friends on the Internet reveal that the teenagers' intention to have real contacts with online pals. Second, the essence of the teenagers'

social context with online friends seems bound to real life. In addition, they have developed their own process of making friends on account of their great adaptability in an online environment. Furthermore, the action of forming a club reflects that they equip themselves with solid strategies to expand their social relationships in group activities and attract more members to join their clubs. The aspects of teenagers' social issues will be discussed in the following sections.

A. Considerations

Teenagers' considerations of making friends online presupposed the real contacts. Caring about not only the general characteristics of a friend, such as age, stature, weight, blood type, and constellation, but also place, school and hobbies, teenagers express the most important one of making friends on the Internet is one's living area, age and honesty:

- Living Area: Most interviewees presented that their first concern is where they live. They expect to have sincere interactions in real life with the online friends. In terms of the distance problem presented in the previous section, one's place becomes of the most importance since it might decide if a teenager is allowed to come out with online friends having a gathering.
- Age: The age limit of making online friends is similar to that in reality. The teenagers tend to make friends of their age. That reflects the demographics of CrazyVote website: over eighty percent of users are between 16-19 years old. In the study, the freshmen and sophomores in college are willing to associate with senior high school students, and all these teenagers present that they have no inclination to making friends with those in 20s, who are adults in the eyes of the teenagers.
- Authenticity: Most teenagers use their real identities to register on the website, including age, gender and living area. They are honest and acquainted with others. For this reason, they ask each other with sincerity, but they also visit one's online album or blog to have a double check on one's authentic identity.
- Devotion: Teenagers are interested in others' social intentions, especially when they are earnest to maintain the relationships on the website. In the study, interviewees explained both situations would show one's devotion to making friend and keeping friendship. One is how much time a person hanged on the website and the other is how enthusiastically he\she was to respond to others messages.
- Lifestyle: Teenagers are very excited and interested to see someone who shares with them the same taste, hobbies or similar lifestyle. Hence, personal web space serves to share one's experiences and life backgrounds, which offer others with a topic to interact with.

For teenagers, the main motive of making friends on the Internet is quite different from others in their 20s, 30s, or above. For instance, in the case of one's living area, some of

interviewees even declined to make friends with those they were not able to meet in reality. Their major considerations of making friends reveal that the teenagers' intention to have real contacts with online pals.

B. From Online Community to Real Contacts

Followed the active purpose of teenager's club forming, their on-line social interactions didn't satisfy them anymore but having face-to-face gatherings. Teenagers then decided not to be restricted on the Internet and established real relationships with on-line friends in reality. The essence of the whole online social circle is bound to real life indeed, which could be demonstrated in several perspectives like social identity, activities, and the scope of social activities.

1) Social identity

Most teenagers do not have the concept of virtual relationship. As the most important social cue, identity directly affects the essence of social contact. Recently, a fundamental problem for social software is the difficulty to establish trust and to convey earnest feeling owing to the lake of social cues. However, in this case of teenagers' social behaviors, this problem does not occur. In the first place, most teenagers used their true identities to get online, and without reluctance gave their personal information, such as age how old they are, place where they live, and school where they go to. Hence, they believed that most users and online clubs they formed have no difference from people and communities in a real world.

2) Activity

In the case study, all of the interviewees expressed that they dreamed to have real contacts with new friend they had met on the Internet. However, they had never met them until they joined the clubs on CrazyVote. This is why the first outing planned by the club *Saint* could be responded by hundred users

With club founders' promotion, a great number of voluntary activities were held constantly by club members or even an ordinary website user. The way they interact with others and the way they think on the Internet show no differences either from those in their daily life. For instance, some of teenagers who enjoyed outdoor activities emphasized that they did not want to associate with who were only addicted to computer games, and some relatively tend to keep in the company with computer game lovers.

In sum, a teenager's activities to do with online friends, which include picnics, window-shopping, singing karaoke, or going to a night market, are very close to what friends will usually do in reality.

3) Scope

As what is mentioned in the previous sections, teenagers' attitudes take a serious thought about "real distance – where they live" between them and their online friends, which indicates that the online social circle for teenagers in this study is not restricted in virtual context, and the purpose of it is put into action in reality. They were trying to become acquainted with those online friends who live in the same area, such as in the same city or a county.

Furthermore, a very short distance is not an attractive feature

to make friend, but sharing something in common and familiarity are. The investigation on the website functions of *the map: where friends live* reveals a specific result. The map is originally designed for teenagers to be aware who live around them, and it makes them share similar experiences and local topics to chat and to have fun. However, the study reveals that comparatively the teenagers were not very interested in making friends with those who live in the same neighborhood. It is very rare to make a contact with someone by way of using the map function. The way teenagers think over the distance of choosing online friends is the same as the way they think of making friends in reality. Distance does cause a problem for friends to see each other from time to time.

To sum up, even though teenagers have several specific considerations for online environment, their online social behaviors and attitudes are still in accordance with what they are in their daily life.

C. Flexible Communicating Ability

In Taiwan most teenagers have plenty experiences of getting on the Internet, and their first time of accessing the Internet could be traced back to the time when they were in the primary school. That might give explanations about that club members in the study do have abilities to deal with varied types of communicating platforms and solve the problems they might face. It also reveals that teenagers equip themselves with abilities to access web-based media and adapt themselves to the diverse and complicated conditions on the Internet.

1) Communicating platforms

The choices and usages of different communicating platforms are based on the depth of acquaintance. In the study, synchronous communicating media as immediate messenger and chat-room are thought inappropriate to use between people who are unacquainted with each other. On the contrary, non-real-time platforms as a message board and a bulletin board are considered as places to concern with unfamiliar friends. In the study, teenagers explained their specific perceptions and usage occasions of the media, discussed in the following respectively:

- Messenger: Messengers are the most common social communicating media for real-time chatting. Teenagers usually use them to communicate with close friends and tend to present more personal information there, such as one's online status and emotions.
- Personal web space: A personal web space is complete open to any visitor, including personal blogs, message board and online photo album, personal web. Teenagers apply it to introduce themselves, to share experiences, and invite others to come into their life.
- Personal message board: Message board, sometimes a part of personal website, is the most important space to make new friends. Teenagers use the message board to welcome to an online stranger in the beginning, and then use it as a non-real-time text-based conversation function to have more interactions with other users.
- Mail: The study explores that the teenagers rarely

contact with their friends through mails.

- Online bulletin: An open place for a group of friends to bulletin information, to change information and to make a decision by collection suggestions or opinions from others. In general, teenagers use bulletin to discuss some specific subjects.
- Chatroom: Chatroom or synchronous conferencing is used for real-time discussion in a group of friends, and they are not as private as messengers. In the study, teenagers use them to make group decisions or run a social activity. In addition, video-based meeting room is only used between intimates.

In teenagers' social activities, a messenger and a message board are both essential to communicate with others. However, a messenger board, compared with messenger, presents two specific features in the process of making friends. First, allowing people to communicate with unfamiliar friends, a message board gives people time to respond slowly to a question and to think over what to say attentively, since it is embarrassing to lose the subjects during real-time conversation. Besides, leaving a message is more appropriate as real-time communicating might sometimes disturb others.

2) Friend making process

Some of the teenagers have started to develop their own communicating model on the Internet while social resources like blogs, bulletins and chat-room are increasingly rising. In the individual inquires, all the informants have presented their active, natural and open-minded attitudes toward social activities. In addition, they possess a similar way to make friends, which has evolved their original personal styles with the accessible resources on the Internet:

- Greeting: The first step in the process is to greet someone they want to make friend with. They will make a contact by complimenting others' articles or pictures with a brief message or an emoticon. If they receive a nice response, it implies the seeds of a relationship might have sprouted.
- Understanding: The second step is trying to understand each others with patience. They are taking their time to know each other better and more via reviewing the updated dairies and photos. The topics sharing with each other in the next stage always flow out of the content of daily articles.
- Interacting: Further, on-line pals start to communicate with each others in this stage. They exchange their personal information like email, account of MSN, or Yahoo messenger. As time passes, they finally become intimate. This communicating model is applied to any case including regular website users and club members.
- Face-to-face Meeting: The final step of making friends is to have actual contact. In the case study of club forming, these members are keen on exchanging their mobile phone numbers, and join club activities such as an outing.

For an initiate of social platforms, it is hard to be aware of the whole thing about making friends. The process is accepted by most active teenagers, who gain experiences of dealing with on-line relationships for a long time. They have also admitted that becoming real friends indeed takes a lot of time and patience to understand and accept each other.

D. Other Culture and Current Social Trend Influence

In the research, the unexpected phenomenon of online clubs formed by the teenagers with a strong will to have face-to-face contacts reveals that group-based social interactions might be more appropriate and safer for teenagers while having a gathering.

1) Extending social relation appropriately

In Taiwan, teenagers under academic pressure mainly make friends with their classmates, a few neighbors or cousins. There are a few students who are able to join extracurricular activities in senior high school or even in college, as mentioned in the introduction.

As general social software, CrazyVote, has provided a web-based platform for teenagers to have opportunities to make friends with whoever living around, they might have different lifestyles but they do have something in common to keep a friendship. Hence, they can meet like-minded friends easily. A significant feature of club forming is that a club member can meet a bunch of online pals at a time. It is very different from traditional social platform, where users have to be acquainted with self-reliance and can only get in touch with a few at once.

In addition, due to club forming successfully the teenagers can get rid of the embarrassment of making new friends with strangers. While making friend, leaving messages to a stranger needs some courage even on the Internet because they might be refused or receive indecent response. Besides, it is generally believed that it's not an appropriate way to meet online pals in terms of Taiwanese culture and customs, while it is approved to meet new friends through mutual friends and earn support from their family or friends. However, in this study the teenagers as team members feel more comfortable without reluctance but with togetherness because they do know who the club members are and what they do.

2) Security and sense of belonging

Most web-based social platforms provide users lots of chances to be acquainted with other through bulletin boards, blogs, mails, messengers or chat rooms. The social context formed on the Internet does not support adequate social nuances, and users' social identities are hardly concerned in such online communities. Even though what users seek on the Internet might try to create a fantasy or to improve their social skills, it is still very unlikely for users to develop their relationships between each other without trust.

As the above-mentioned, club leaders will expostulate with discourteous one on the misbehavior to protect and take care of other members. And t is much secure for teenagers to be acquainted with others and then to go out in a group. These CV clubs are formed as a mini society with a sound purpose to make friends on the Internet and then in reality.

To extend the interpersonal relationships and to get in touch

with different people, teenagers' motivation of making friends is straight and simple. They are not conscious of the differences of social nuance between the virtual context and real world. However, teenagers tend to expose their personal information and lack the wariness of online fraud and potential dangerous existing intentions.

V. DESIGN IMPLICATIONS

The findings of research on teenagers' club forming voluntarily indicate the inner values of the teenaged on-line users and their expectations of interpersonal relationships. To enhance social interactions for a certain group, the design implications for social software offer suggestions based on several issues in this paper, which are teenagers' social considerations, communicating ability, friend making process and group social model.

1) Focusing on a limited range of user types: According to teenagers' concerns about age and similar lifestyle, members of an online community should be simple, clear, and restricted to well-defined target users.
2) Linking together with user's life context: The elements of design, including social interactions and features of appearance, have to be coherent with target users' original life context.
3) Participating in and perceiving: Developers and designers need to participate in certain online communities and to perceive the subtle variations of users' behaviors and concerns, which may present valuable information for creative redesigning.
4) Serving as a window for users to meet others: Most users already get used to communication by certain media. If the main purpose of social software is not designed to provide convenient communicating functions, it should be as simple as a window for users to meet others.
5) Lowering the threshold in the beginning: The first step to meet a stranger and to say hello should be considerate and appropriate. The first contact should be designed more easily rather than leaving a message.
6) Defining the friend making process: For the target users to make friend with others appropriately, developers and designers need to define a set of steps, which are noticeable and learnable.
7) Building the group social model: Social contacts based on the group relations possess the sense of belonging and trust. Hence, a group social model could be developed in the design concept of social interactions.
8) Making users' relations visible: The design allows users to expand their social circles spontaneously through the mutual friends by visualizing users' relations.

As the suggestions reveal, applying the wholly understanding of target users to design concepts could make a design more acceptable, reliable and consistent with users' original social context. For different groups and types, the design of computer-mediated communication and social interaction might take the same considerations into account to meet online users' deep needs.

VI. CONCLUSION

This study shows that the boundary between on-line social interactions and actual relationships is blurred to the teenaged online users on CrazyVote. Their motivation of making friends on the Internet is straight and simple while extending the interpersonal relationships and getting in touch with other users. The on-line social behaviors reveal that they have developed their own process of making friends on account of their great adaptability in an online environment.

The teenaged online users' social contact is not restricted in virtual context. In the case of voluntarily club forming, teenagers tried to organize themselves with definite social purposes and tried to bring their online communities into reality to have face-to-face gatherings. The action of forming a club reflects that teenagers equip themselves with solid strategies to expand their social relationships in group activities and attract more members to join their clubs. In addition, the group-based social interactions are more appropriate and safer for teenagers while having a gathering, since it is approved to meet new friends through mutual friends and earn support from their family or friends in terms of Taiwanese culture and customs. With trust and a sense of belonging, their clubs are formed completely as a mini society.

In conclusions, the case study of teenagers' behaviors and attitudes presents their on-line social activities are tightly bound to the real life context with plenty cultural features. It is hope that this study might inspire more design concepts for social software in the future by understanding and drawing more attention of the contextual and cultural concerns in technology development.

REFERENCES

[1] B. Wellman and K. Hampton, "Living networked on and offline," *Contemporary Sociology*, vol. 28, no. 6, pp. 648-654, Nov. 1999
[2] J. Preece and D. Maloney-Krichmar, "Online communities: Focusing on sociability and usability," in *The human-computer interaction handbook: Fundamentals, evolving technologies and emerging applications*, J. A. Jacko and A. Sears, Ed. Mahwah, NJ: Lawrence Erlbaum, 2002, pp. 596-620.
[3] D. S. Ranson, E. S. Patterson, D. L. Kidwell, G. A. Renner, M. L. Matthews, J. M. Corban, E. Seculov, and C. S. Souhleris, "Rapid scout: Bridging the gulf between physical and virtual environments," in *Proc. the SIGCHI Conf. Human Factors in Computing Systems*, New York: ACM, 1996, pp. 442-449.
[4] H. Hutchinson, W. Mackay, B. Westerlund, B. Bederson, A. Druin, C. Plaisant, M. Beaudouin-Lafon, S. Conversy, H. Evans, H. Hansen, N. Roussel, and B. Eiderbäck, "Technology probes: Inspiring design for and

with families," in *Proc. the SIGCHI Conf. Human Factors in Computing Systems*, New York: ACM, 2003, pp. 17-24.

[5] B. A. Nardi, D. J. Schiano, and M. Gumbrecht, "Blogging as social activity, or, would you let 900 million people read your diary"? In *Proc. the 2004 ACM Conf. Computer Supported Cooperative Work*, New York: ACM, 2004, pp. 222-231.

[6] S. Herring, L. A. Scheidt, S. Bonus, and E. Wright, "Bridging the gap: A genre analysis of weblogs," in *Proc. the 37th Annual Hawaii International Conf. System Sciences*, Washington, DC: IEEE Computer Society, track 4, vol. 4, p. 40101.2.

[7] R. Kumar, J. Novak, P. Raghavan, and A. Tomkins, "Structure and evolution of blogspace," *Communications of the ACM*, vol. 47, no. 12, pp. 35-39, Dec. 2004.

[8] J. A. Hughes, D. Randall, and D. Shapiro, "From ethnographic record to system design: Some experiences from the field," *Computer Supported Cooperative Work*, vol. 1, no. 3, pp.123-142, Mar. 1993.

[9] F. Kensing and J. Blomberg, "Participatory design: Issues and concerns," *Computer Supported Cooperative Work*, vol. 7, no. 3-4, pp. 67-185, Sep. 1998.

[10] G. Hofstede, *Culture's consequences, international differences in work-related values*. Berverly Hills, CA: Sage, 1980.

[11] H. R. Markus and S. Kitayama, "Culture and the self: Implications for cognition, emotion, and motivation," *Psychological Review*, vol. 98, no. 2, pp. 224-253, 1991.

[12] L. Herman, "Towards effective usability evaluation in Asia: Cross-cultural differences," in *Proc. the 6th Australian Conf. Computer-Human Interaction*, Washington, DC: IEEE Computer Society, 1996, pp. 135-136.

[13] A. Yeo. "Cultural effects in usability assessment," in *CHI 98 Conf. Summary on Human Factors in Computing Systems*, New York: ACM, 1998, pp. 74-75.

[14] W. Barber and A. Badre, "Culturability: The merging of culture and usability," in *Proc. the 4th Conf. Human Factors and the Web*. Available: http://zing.ncsl.nist.gov/hfweb/att4/proceedings/barber/

[15] T. Clemmensen, Q. Shi, J. Kumar, H. Li, X. Sun, and P. Yammiyavar, "Cultural usability tests – How usability tests are not the same all over the world," in *Proc. of the 12th Conf. Human Computer Interaction: Usability and Internationalization*, Springer-Verlag Berlin Heidelberg, 2007, pp. 281-290.

[16] H. Beyer and K. Holtzblatt, *Contextual design: Defining customer-centered systems*, San Francisco: Morgan Kaufmann Publishers, 1998.

[17] T. Lindlof, *Qualitative Communication Research Methods*, London: Sage, 1995, pp. 163-175

[18] A. Fontana and F. Frey, "Interviewing: The art of science," in *Collecting and Interpreting Qualitative Materials*, N. K. Denzin and Y. S. Lincoln Ed. London: Sage, 1998, pp. 47-60.

[19] L. Sproull and S. Kiesler, *Connections: New ways of working in the networked organization*. Cambridge, MA: MIT Press, 1991.

[20] J. Donath, "Mediated faces," in *Proc. the 4th International Conf. Cognitive Technology: Instruments of Mind*, London: Springer-Verlag, 2001, pp. 373-390.

[21] S. Agamanolis, "Designing displays for human connectedness," in *Public and situated displays: Social and interactional aspects of shared display technologies*, K. O'Hara, M. Perry, E. Churchill and D. Russell, Ed. Boston: Kluwer Academic Publishers, 2003, pp. 309-334.

[22] K. Holtzblatt and S. Jones, "Contextual inquiry: A participatory technique for system design," in *Participatory design: Principles and practices*, D. Schuler and A. Namioka, ed. Hillsdale, NJ: Lawrence Erlbaum Associates, 1993, pp. 177-210.

[23] K. H. Huang and Y. S. Deng, "Social interaction design in cultural context: A case study of a traditional social activity." *International Journal of Design*, vol. 2, no. 2, pp 81-96, 2008.

Ko-Hsun Huang is a PhD student in the Institute of Applied Arts at National Chiao-Tung University, Hsinchu, Taiwan. She received her BE degree in Computer Science and Information Engineering in 2004 from National Chiao-Tung University, and her MS degree from the university's Institute of Applied Arts in 2006. Her research has focused on how emerging technologies affect people's communication and social relationships, and how these technologies play a role in different cultures. She is also interested in interactive interface design and product design issues.

Dr. Yi-Shin Deng is an Associate Professor of Institute of Applied Arts at National Chiao Tung University, Taiwan. He is an active researcher and instructor on topics including human-computer interaction, user experience design, social computing, design theory and methodology and computational design. Other research and practice centers on applying user research approach and exploration design processes to ICT device design, social software platform development, and service design.