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碩 士 論 文

建構健康應用程式的使用者價值脈絡

User-Value-Based Approach for Wellness Application Software Design

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中 華 民 國 一百 年 七 月

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摘要

在現今社會中，漫長的工作時數，過多加工的飲食習慣，緊湊的生活步調和運動習慣的缺乏，讓人們的生活方式漸趨於不健康。因應這樣的情形，越來越多的科技發明被應用於健康保健之中。能夠隨身攜帶並做高效能處理運算的智慧手機，裝載運動健康相關應用程式，便是其一之應用。

然而，在這全新的領域中， 使用者對於健康的態度與價值仍未被完整建立，同時，現有產品的設計元素該如何轉換至手機平台中也仍是個考驗。因此，本研究之目的為提供一個探討使用者需求與價值，從而發展對應設計手法的脈絡架構，並以健康應用程式做為研究主題。

本研究根據方法-目的理論(Means-end theory)，進行階梯訪談，從現有健康服務的屬性項目，往下深入探究使用者所在乎的價值與需求，同時，由現有的應用程式軟體使用經驗分享，發掘能夠提供給使用者正面情緒的形容詞感受。由訪談結果，我們將受訪者在陳述感受時有關於情緒的形容詞提出，以此作為關鍵詞，將現有健康服務產品知覺圖中，有關健康價值的階層，與手機應用程式產品知覺圖中有關功能感受的階層做合併，並於圖中之關係鍊加上影響程度權重，最終獲得一個整合後的健康應用程式知覺圖 *P-HVM*。設計師們可以從中看出使用者在健康保健中所在意的價值觀，與能夠滿足這些需求的情緒感受，因而從此發展相符的設計元素於手機健康應用程式中。

而本研究所規劃探究使用價值的脈絡結構，不僅僅適用於手機應用程式設計規畫，同時可應用於創新領域之設計發展，當設計師面對一個全新的設計環境時，藉由現有產品的使用經驗，結合該場域的需求價值，可進而推衍出符合使用者價值的設計。

關鍵字:

使用者經驗設計、以價值中心設計、應用程式軟體設計、方法-目的理論、健康應用程式

Abstract

In contemporary society, the alarmingly growing numbers of people around the world are living a physically inactive life style. To cope with this problem, Wellness application software is designed to support health promotion. However, in this newly developed field, the users' values haven't investigated extensively, and the design strategy hasn't delivered to help transforming the existing product attributes into new design opportunities. Therefore, the aim of this study attempts to provide a process that can help designers better determine users' needs in the new field, and investigate the design factors match targeted values.

This research is undertaken through interviews by the method of Means-end theory to define users' values from the existing wellness services, and also the consequences from the usage of other popular applications. Based on the previous result, the study uses the emotional consequences as key nodes to cross the value part of the Hierarchical Value Maps from wellness domain and the consequences part of the HVM from applications field, and adds the influential weights, determined from quantitative survey, on the linkages to carry out the proposed HVM, *P-HVM*.

The finding is delivered with values that are the basis knowledge of users' attitude toward wellness, the consequences employed as corresponding design factors for wellness APPs and the approach to conduct crossing process to attain the proposed HVM, which can be applied for valued-based design.

Keywords:

User Experience, Value-Centered Design, Means-end Theory, Laddering, Wellness Promotion, Application Software design

誌謝

三年的研究生涯結束了，回首這些日子，能夠進入交大應藝所是一件幸福又幸運的事，其中最甚，便是遇到我的指導教授鄧老師。

很謝謝老師您這些日子來的教導，無論是在課業或是生活中，您總是開啟了讓我”思考”的途徑，在每一次寶貴的學習、比賽與實習機會，都讓我熱愛自己所學，以及對自我更加肯定。而您對於學生的關心以及獨具個人風格的生活哲學，也讓我既尊敬又崇拜，就算畢業了，也一定要常常回去”吵”您和師母，繼續向您學習更多又酷又好玩的知識以及生活方式! 此外，我也要謝謝這三年來遇到的每位老師，帶領我們進入設計之門的林老師，在論文上給予我很多建議的莊老師以及成大的簡老師，謝謝您們的指導與意見，讓我鞭策自己更加努力與進步。

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王育婕 謹誌
中華民過一百年七月

Contents

Table Content

Figure Content

Chapter 1

Introduction

According to the alarmingly growing number of people around the world living a physically inactive life style, science and technologies have been developed nowadays to encourage wellness involvement, for example, the emergence of mobile applications is taking on the role to help and manage our wellness habits. With the shifting focus in human-computer interaction, designers put more emphasis on bringing good user experience due to targeted users' values, instead of delivering various functionalities. Thus, how to apply these inherent values into the using context of newly developed industry is an emerging issue that we should place more importance on.

1.1 Background

In the modern society, people's life style is characterized by physically inactive with lacking of exercise, nutrition imbalanced caused by unhealthy eating habit, and high stress level due to the prolonged working hours. The kind of living style will cause diseases, such as overweight, obesity, cardiovascular and diabetes, which becoming global problems, since they are increasing observed not only in the developed world, but also the developing world (Ahtinen, Ramiah, Blom, & Isomursu, 2008).

According to the investigation, there are about 44.1% Taiwanese are overweight or obese; in which male ratio is 50.8% and female ratio is 36.9%. Besides, among the ten major causes of death in Taiwan, there are seven causes of death associated with

obesity, which include cancer, heart disease, cerebrovascular disease, diabetes, chronic lower respiratory diseases, chronic liver disease and chronic kidney disease. In addition, obesity can also lead to degenerative arthritis, metabolic syndrome, dyslipidemia and hypertension (DOH, 2008).

To cope with these problems, Wellness technologies and application software are designed to support wellness promotion. They track, maintain and motivate users' health lives management, such as heart rate monitors, step counters and sport related web portals. Technological devices and applications can act as persuaders on wellness promotion domain, especially mobile ones, which can be kept along all the time, allowing timely suggestions and reminds (Ahtinenet al., 2009).

In Taiwan, the most popular mobile device is mobile phones. A research of Institute for Information Industry (2009) shows that the penetration rate of mobile users in 2009 was 116.6%, which shows that mobile phones have become an important part of people's everyday lives. Users consider their mobile phones personal and private that they store various types of information on their phones, such as the contact information of family and friends, messages, photos, and videos (Srivastava, 2005). With the growing advances in telecommunications, mobile phones have evolved into smartphones, a convergence between phone and handheld computer. Smartphones are predominately communication devices, with additional computing power built in, which usually allows the user to install and run more advanced application software, which also known as an *application* or an "*APP*". Thus, smartphones run complete operating system software providing a platform for application developers, including the wellness promotion ones.

Based on varied aspects of mobile technologies, there are different kinds of health care and fitness related mobile applications nowadays. They proposed different functions and strategies to support users' needs, moreover, to change their

attitudes and attract them to form the habit of taking exercise. For example, Healthy Store is an application on Apple's App store, it can help users manage three important health data through wireless internet, including BMI, blood pressure, glucose data, and generate charts and advices based on the changes. Micoach, presented by Adidas, is an application use GPS to record the distance, calories consumption, elapsed time and real-time voice guidance while you are running. In short, the practicality and functionality of wellness applications are definitely a popular topic newly rise in the field of mobile technology.

Fig. 1-1 the user interface of Healthy Store and Micoach

1.2 Motivation

The related studies show that wellness applications can have positive impacts on users to involve in physically activities (Arteaga, Kudeki, Woodworth, & Kurniawan, 2010) (Anderson et al., 2007).

Nevertheless, during another wellness service design project, *The Innovative Design of Wellness Services*, we wanted to know users' attitude toward wellness and apply it to design. Thus, we showed three interviewees nine existent wellness services, fitness center, sporting game, health camp, health management web portal

and wellness APPs, to let them choose according to their preference. Surprisingly, they all indicated that the wellness applications, Nike+ and Micoach, are the last services attract them to use. We couldn't help but start thinking that since so many researches claim the positive impacts of wellness applications, why users still refuse to use them?

A substantial body of research explains the tendency of the situation.

In the past decade, the focus in Human Computer Interaction has shifted from usability parameters to emotions and experiences (Bødker, 2006). Abeele and Zaman (2009) provided an excellent review that designing for the user experience requires considering the full meaning an artifact holds for a user, which leads to the question "How do products features relate to personal values?"

Cockton (2004) highly recommended that designing user experience is designing for users' value. Designers should understand what is valued by a system's stakeholders and support them by delivering this value, which is suggested to be reached from the Means-End Theory (Gutman & Reynold, 1988). Means-End Theory specifically focuses on the linkages between the attributes that exist in products (the means), the consequences for the consumer provided by the attributes, and attains the personal values (the ends) that the consequences fulfill.

However, in a whole new area that users haven't built up their value system yet, how do we deliver a good and corresponding experience?

In recent years, according to the growth of the rise of smartphones, it brings up trends of APPs design that many designers across the globe try their skills to combine different topics with this new mobile medium. Correspondingly, new design issues rise. The considerations of "Whether users change their inherent values when facing a new operating environment?" or "How to transfer users' needs into design factors that APPs deliver?" are struggled with designers.

While there are some literatures solve the problems to identify users' values by Means-end theory, they usually utilize the existing attributes of the products to get the related consequences and the linked values in the using context (Leitner, Wolkerstorfer, Sefelin, & Tscheligi, 2008). But in a new field, the existing attributes aren't very extensive. If the important value that users really cared can't be related from those attributes, then they still can't deliver the design expected and accepted by their target users. In addition, although the important values can be linked from the attributes, designers still need to figure out how to transform them into design factors in the new operating environment.

In summary, with the increasing usage of wellness APPs, offering an adaptive design method has become more critical. Ahtinen et al. (2008) pointed out that losing weight or reducing the risk of disease is the main motivation to exercise or manage one's health life. However, the weight or health improvement does not vary much in short-term period. Thus, if APPs, which is portable and accessible easily, can deliver good user experience to its target users for long-term use, then it may be a turning point for developing a healthy living style.

1.3 Objectives

The purpose of this study is to provide an opportunity in the new developing environment that designers can apply a design strategy, which can help them to better determine target users' attitudes and needs in this new field. Additionally, investigate the design factors match users' values. With the point of view, this research applies wellness application as the key subject and the aims are shown as follows:

A. Deliver the values cared by users in the wellness

Build the values that people really care in the field of wellness, which acquired

from multi-faceted aspects of consideration, not only depend on a single product or service.

B. Carry out the design opportunities for wellness applications based on users' values

To figure out the feelings associated with the target values in the wellness, and apply them as the design factors in the future.

C. Propose the approach deals with the situation of the new-field design

The study offers the suggested process and guidelines that help designers deliver a value-based design, which can be applied to different subjects, not only in the field of wellness we apply in this research.

1.4 Outline of thesis

There are six chapters in this thesis. This chapter introduced the research background, motivation, and the objectives of the study. The remainder of the thesis is structured as follows:

Chapter 2 illustrates the scope of this research work and develops the theoretical and technical background. First, the definition of wellness and the field of wellness applications are reviewed independently. Second, the importance of users' values and the method to get them are described

Chapter 3 describes the methodology of users' attitude getting in qualitative research, the data collecting in quantitative research, and analyzes this research in detail.

Chapter 4 presents the findings extracted and summed up from data coding.

Chapter 5 summarizes insights in terms of wellness application design and delivers the implications and suggestions as a design approach for APPs.

Chapter 6 lastly specifies the conclusions and identifies further work to be done in this field.

Chapter 2

Literature Reviews

For the development in the wellness, there were numerous literatures proposing strategies and definition to promote it from different aspects. In this chapter, the study presents the scope of wellness and wellness applications. In addition, exposing the meaning of value and the method to attain it is also the focal point to carry out.

2.1 The research scope of Wellness

When people are talking about wellness, the very first image jumps into our minds is the opposite of illness. Making effort to define the wellness usually begin with references to World Health Organization (1967)'s definition, being not just the absence of illness but a state of complete physical, mental, and social well-being. Besides, National Wellness Institute (1977) defines that wellness is an active process of becoming aware of and making choices toward a more successful existence.

Many conceptualizations of wellness not only indicate the quality of state of being in good health, but explore the various elements, or interrelated areas, that comprise wellness (Roscoe, 2009). Adams, Bezner and Steinhardt (1997) conceptualized wellness from a systems perspective, and labeled the six dimensions of wellness as social, the perception of having support from and provide support to family and friends; spiritual, a positive sense of meaning and purpose in life; physical, a positive perception and expectation of physical health; intellectual, the perception of being internally energize by an optimal amount of intellectually stimulating

activity; emotional, a secure self-identity and a positive sense of self-regard; psychological, perception that one will experience positive outcomes to the events and circumstances of life. Figure 2-1 shows the wellness model with these six dimensions that the top of the model is expanded to the fullest extent of wellness, whereas the tightly constricted bottom represents illness.

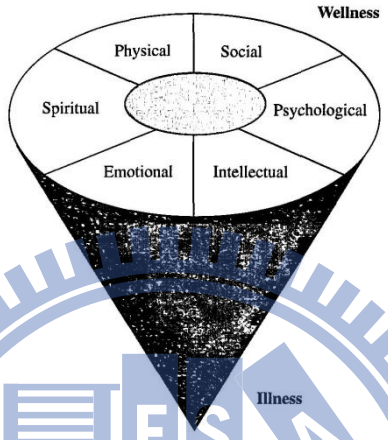


Fig 2-1 the wellness model

However, Roscoe (2009) pointed out that Adams's definition of physical wellness is subjective, and added that the physical wellness is the active and continuous effort to maintain the optimum level of physical activity and focus on nutrition, as well as self-care and maintaining health lifestyle choices, which are more comprehensive.

In addition, Hettler(1980) included occupational wellness, defined as the level of satisfaction and enrichment gained by one's work and the extent to which one's occupation allows for the expression of one's values. And contribute one's unique skills and talents to the community in meaningful ways. Renger et al. (2000) carried on to include environmental wellness as a separate dimension and defined it to include the impact on and balance between home and work life, as well as an individual's relationship with nature and community resources.

Thus, we can generalize that the proposed holistic model of wellness will, therefore, comprise eight dimensions, social, spiritual, physical, intellectual, emotional, psychological, occupational and environmental. Basically, people put effort to maintain the physical activities to satisfy their expectation of health life style, and through the stimulating activity, such as occupation, to be energized to contribute one's skills and express personal values. In the mean time, one will keep friends and families in his relationships, and support each other to maintain the balance between social network and family. From experiencing these positive outcomes, he can attain secure self-identity and learn the meaning and purpose of life.

2.2 Potential of mobile technologies

Mobile computing is a form of human–computer interaction where a computer is expected to be transported during normal usage. Many types of mobile computers have been introduced since the 1990s, such as wearable computer, Personal digital assistant and Smartphone.

Mobile computing has three aspects: mobile communication, mobile hardware, and mobile software. Firstly, the most common data connections in the mobile computing are the General Packet Radio Service (GPRS), which has maximum data rate 115 kbps (Granbohm & Wiklund, 1999), the 3G network, the maximum data rate 2 Mbps (Comer, 2008), and Wireless Local Area Network (WLAN), the maximum data rates from 54 to 600 Mbps (LAN/MAN Standards Committee of the IEEE Computer Society, 1999), through these, users can access website, send email and instantly message with friends.

Secondly, mobile hardware provides diverse functionalities. Storage and the processing capabilities enable the advanced analysis of data to support personalized

feedback and decision making locally (Mattila, 2010). Multimedia includes a combination of text, audio, still images, animation, video, and interactivity content forms. The integrated tools can record and store photo and video materials on the device (Leitner et al., 2008), and let users listening to their mp3 collection on the move.

Lastly, the third aspect copes with the characteristics of mobile applications. For instance, a key feature of a smart phone is that additional applications can be installed on the device. These applications can be developed by the manufacturer, the operator or any other third party like the user or any software developer. Thus, users can install, configure or run applications of their interests on the smartphone (Singh, Bhargava, & KAIN, 2008).

2.3 Design factors of wellness applications

A substantial body of research documented that being physically active and taking care of one's wellbeing requires motivation (Arteaga et al., 2010). Ahtinen et al. (2008) went even further to point out that by identifying cross-cultural factors, users in both Finland and India need to be motivated in using the application that can then support motivation towards wellness activities. They used Malone and Lepper's intrinsic motivational theory (1987), challenge, curiosity, control, fantasy, competition, cooperation and recognition, as design factors to keep users interested in using wellness applications.

The factor, *challenge*, was employed as setting goals. Providing goals which attainment is uncertain, can make an activity challenging, but it should also provide performance feedback concerning goal attainment to engage and enhance the

self-esteem of the individual involved activity (Malone et al., 1987). For example, 5K Coach Plans is a goal-oriented APP on Apple's APP store. To interpret a lot of beginning runners' dream of long run, it can personalize users' plan to fit their schedule for ability level, and provide run performance as feedback to encourage users.

The *curiosity* factor can be stimulation to break people's knowledge structures, which will help maintain the level of motivation in an ongoing task (Malone et al., 1987). Ahtinen et al. (2008) suggested that prompts and alarms are one way this factor is utilized. Dr.eye iWalk provides the real-time reminder to help users adjust paces during walking is a good example for this.

The *control* factor makes people experience oneself as an "origin" of one's actions and choices, this cause-and effect relationship will make them believe in the work will bring them powerful impacts (Malone et al., 1987). Ahtinen et al. (2008) pointed out that in wellness applications, this means giving users information about how lifestyle changes will affect them. Take a look at the Calorie Counter from Android market, which can automatically help individuals calculate calories, fat, and carbohydrate of the food they eat, and the records and charts will show the progress of health.

Fantasy is most likely to fulfill emotional needs, but not actually present in the real situation. It can provide imaginary characters, with which the individual can identify (Malone et al., 1987). Wellness games employ this motivational factor; for example, Kinect is a controller-free gaming and entertainment experience by Microsoft for the Xbox 360 video game platform. With the virtual context, it can encourage physical movement in the progress of the game.

Competition and *cooperation* are the factors leverage peer pressure and support to motivate individuals. Shakra is an application tracks users' general level of activity,

on which they can see each other's activity when they were apart, and care for each other. In the meantime, users can also view to assess their performance in relation to their peers. The authors have observed encouraging results that social networks can have on the actions of an individual. Thus, they suggest that the system should facilitate the sharing and comparison of data between peers (Anderson et al., 2007).

The final type of factors is *recognition*, which means people enjoy having efforts and accomplishments recognized and appreciated by others. Runkeeper uses GPS to track users' fitness activities. It can post running records to Facebook, which includes distance, time, pace, calories, heart rate, and path traveled on a map. Knowing that friends are watching individual's workout is a great peer pressure reinforcement to run faster and more often.

In this study, the wellness applications we employed to conduct the interviews, Nike+ and Fit 4 Rhythm, use a lot of elements of the motivation theory, which will be introduced in Chapter 3.

2.4 Experience and Values

In the past decades, Human Computer Interaction has been largely applied in several areas, researchers put a lot of emphasis on the interaction and interface design between users and devices (Ai, Lu, & Deogun, 2008). The issues of usability, such as the ease and learnability of use, are discussed widely. Since the growing popularity of knowledge from social, emotional and behavioral fields have been adapted to explore the interaction design; people start to center on not simply functions, but the fun and joy of use, which is usually recognized as user experience (Forlizzi & Battarbee, 2004).

The field of user experience is established to cover the holistic perspective to

how a person feels about using a system. The focus is on pleasure and value rather than on performance. Thus, designers should address question on not only ”Can users complete a task fast and correctly during the operation”, but “Did they perceive the usage as good experiences?”

Forlizzi and Ford (2000) include users’ values as one influencing factor in user experience, with other user-related factors, such as users’ emotions, cognitive models, and prior experiences. Besides, Jääskö and Mattelmäki (2003) suggest personal motivation, attitudes and values having influence in the user experience. Moreover, Cockton (2004) and others have been advocating that designing user experiences is designing for value.

Therefore, we can conclude that to provide a good experience, values must be considered.

2.4.1 Value in marketing sciences

The definition of value in marketing sciences usually is identified as the product value that can deliver commercial benefits to customers (Kotler, 1999). Bettman, Luce, and Payne (1998) proposed customer value perceptions. It’s the value that customers perceive they receive or experience by using the offering, and it may differ depending on usage situation, customers’ personal values, needs, preferences and financial resources (Ravald & Grönroos, 1996) (Anckar, & D’Incau 2002).

2.4.2 Values in psychology

When individuals face the situation of making choices, we usually choose by

considering what are important to us, what meet our needs, and what are based on our values.

Rokeach (1973) referred to the relationship between values and needs. It is known that people make tradeoffs while making everyday decisions. He said, "Values are the cognitive representations and transformations of needs, and man is the only animal capable of such representations and transformations."

According to Maslow's hierarchy of needs, people have physiological, safety, social, esteem, and self-actualization needs. Trying to meet these needs makes us face the dilemma of choice, but Maslow proposed that physiological is the basic level, if these needs are not met, a person cannot be motivated by the upper levels of needs. The Maslow's hierarchy of needs shows in Table 2-1.

In addition, Rokeach defined a value as an enduring belief that serves as personal or social preferable criteria for decisions making and priorities setting, and provide explanations we give for our actions. Verplanken and Holland (2002) then pointed out, values are culturally shared, but individuals differ in how they rank the importance of specific values.

7	Self-actualization	To achieve one's full potential
6	Aesthetic needs	Harmony, order, beauty
5	Cognitive needs	Curiosity, exploration, understanding of world
4	Esteem needs	To be competent and recognized
3	Attachment needs	To love and to be loved, to have friends
2	Safety needs	Security, comfort, freedom from fear
1	Physiological needs	Food, water, oxygen, rest

Table 2-1 Maslow's hierarchy of needs

2.4.3 Users' values

Kujala and Mattila (2007) first clarify the concept of value from the user's point of view. They refute the perspective of the value in marketing sciences, and argue that a product or system does not have any absolute value.

They propose the term 'user values' to describe that when users interact with the product, they bring psychological values into the context, which affect their views as to what kind of purpose, functions and characteristics they want, and these values don't automatically arise from product properties.

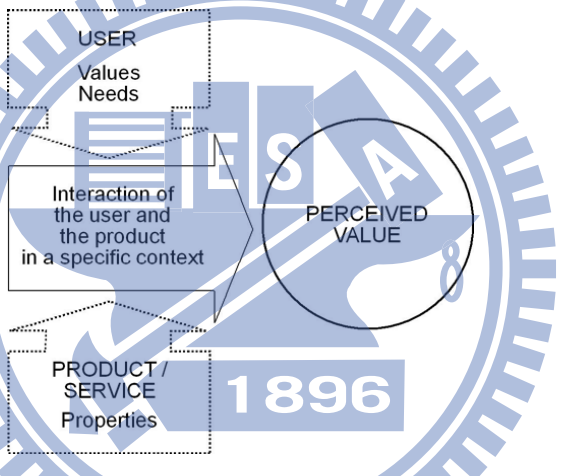


Fig 2-2 diagram of users' values

2.4.4 Summary

Psychology and marketing provide a good theoretical starting point for understanding values. Marketing states that experiences provided by products will create perceived values to customers, and psychology presents that values are the representations of needs. In this study, we take the points from 'user values', which means users bring their personal psychological values into the usage, and come out perceived values. It's based on the definition from psychology, and also meets the subject of the study that we want to figure out users' personal values in wellness,

and applied them to the developments of related applications.

2.5 Laddering the experience

To get the users' values, which are objective and qualitative, Gutman(1982) proposed a qualitative method, Means-End Theory. The theory specifically focuses on the linkages between the attributes, which are equated with characteristics of a product (the "means"), the consequences from consumers provided by the attributes, which are more abstract, and these elements reinforce the personal values (the "ends") (Leitner et al., 2008). Values represent motivational constructs and desirable goals that are directly tied to human emotions (Reynolds, & Olson, 2001).Thus, through the means-end approach, researchers can understand the meaning that (product) attributes bring to users.

Attributes → **Consequence** → **Values**

2.5.1 Skills for attaining values

The means-end approach begins with the interview, that is personal, individual, in-depth, semistructured, and first developed by Hinkle (1965). Generally speaking, the interview is first prompted to identify salient attributes by asking participants to distinguish alternative choices among several products. By asking "Why is this important to you?", interviewees can figure out why these characteristics are important to participants, and these questions can be repeated as many times as needed to reveal the abstractive level, when no further level of abstraction is possible, will end up on the level of personal values (Barrena, & Sánchez, 2010).

It's notable that sometimes participants simply do not want to talk about their

personal emotions and refused to reach a certain level of abstraction. At this point, not every chain can end up in a value (Olson, & Reynolds, 1983). But most of the time, each abstractive level can be further broken down into sub-levels. Walker and Olson (1991) suggest there are six levels in the means-end chain, shows in Table 2-2.

1	concrete attributes	The desired characteristics of the products.
2	abstract attributes	The attributes of the product that cannot be checked prior to consumption
3	functional consequences	The benefits that consumers can directly experience with the product.
4	psychological consequences	The consequences which are more social and personal.
5	instrumental values	The intangible goal that consumer take actions to achieve it.
6	terminal values	The desired end states.

Table 2-2 six levels of the means-end chain

The three lower levels, concrete attributes, abstract attributes and functional consequences, are direct knowledge from products. On the other hand, the three higher levels, psychological consequences, instrumental values and terminal values, are the knowledge and cognition from consumers themselves.

2.5.2 Hierarchical Value Map

Then after summarizing all the elements and connections from the laddering, researcher can construct the hierarchical value map (HVM), which is graphically present all the relation in a tree diagram. When constructing the relation, researcher should consider that if A —> B and B—> C and C —> D, then a chain A-B-C-D is formed (Reynolds & Gutman, 1988).

2.5.3 Related works

There exist several studies on identifying users' values by using means-end theory. Leitner et al. (2008) applied this method to discern direct and indirect links in the field of mobile multimedia. They let participants choose the device characteristics, which are important to them, as the attributes, and then started with these attributes to find out consequences and values. By building ladders, it helps to show dependencies between these elements and how users experience their device.

However, Abeele and Zaman (2009) wanted to figure out which computer game controller, Steering Wheel or Classic Controlle, can meet participants' values. Differing from other studies, it is rather likely that a participant starts his ladder by listing functional consequences, rather than mentioning attributes. Thus, they can know which attribute can cause the consequence that is important to user, and related to what kind of personal values. In this case, the interviewer should make sure that a participant first climbs down the ladder (from functional consequence to concrete attribute) before climbing up the ladder. Instead of asking "Why?", climbing down the ladder is done by asking "What caused this?"

The structure of the laddering shows below:

It's *Easier (FC) ->I'll be More experienced (FC) -> It has same layout as PlayStation controller (CA) ->I am can Perform better (PSC) -> I want to win (IV) -> I want to be the best (TV).*

Although the two studies started the laddering from different status, but both of them attained the values from existing attributes of target products, which can elicit the attributes that are linked by values as design factors in the future.

2.6 Summary

Based on the literature review and case study in this chapter, we had an initial understanding of the recent studies of wellness and values, as well as the technologies in mobile computing. In the following chapters, through the interviews, the study will investigate users' values regarding the Means-end approaches towards wellness design.

Chapter 3

Methodology

The health consciousness has been rising that people have gradually tended to take the physical activities to maintain healthy living style. With the development of applications, designers have tried to combine the wellness issues with mobile devices. In this newly competitive market, the best way to deliver a good user experience is to determine what users really need and what they really care.

The objective of this thesis is to explore users' values in the wellness through a systematic user study process. In this chapter, the study presents the way to go through the process that the proposed results will help designers to understand the context and the users they design for in the area of mobile HCI.

3.1 Framework

The research structure focuses on the values cared by users, and the important consequences linked to these values. To conduct the result we expect the research is divided into three stages.

Firstly, ladder users' values. The study uses Means-End theory to define users' attitude toward wellness from the existing wellness services, and also user experiences of other applications that used or welcomed by participants. The result will show the general values in the wellness and the corresponding feelings.

Secondly, develop the HVMs. The result of interview is employed to do the Hierarchical Value Map. The study wants to provide a proposed HVM that can

forecast users' values and design specification in the new field by crossing the HVMs in several related subjects.

Lastly, weight the HVMs. The questionnaire is sent out to get the evidence that shows the exact impact of the consequences to specific values in our proposed HVM. Through this stage, designers can select the preferred consequence as design factors to meet users' values.

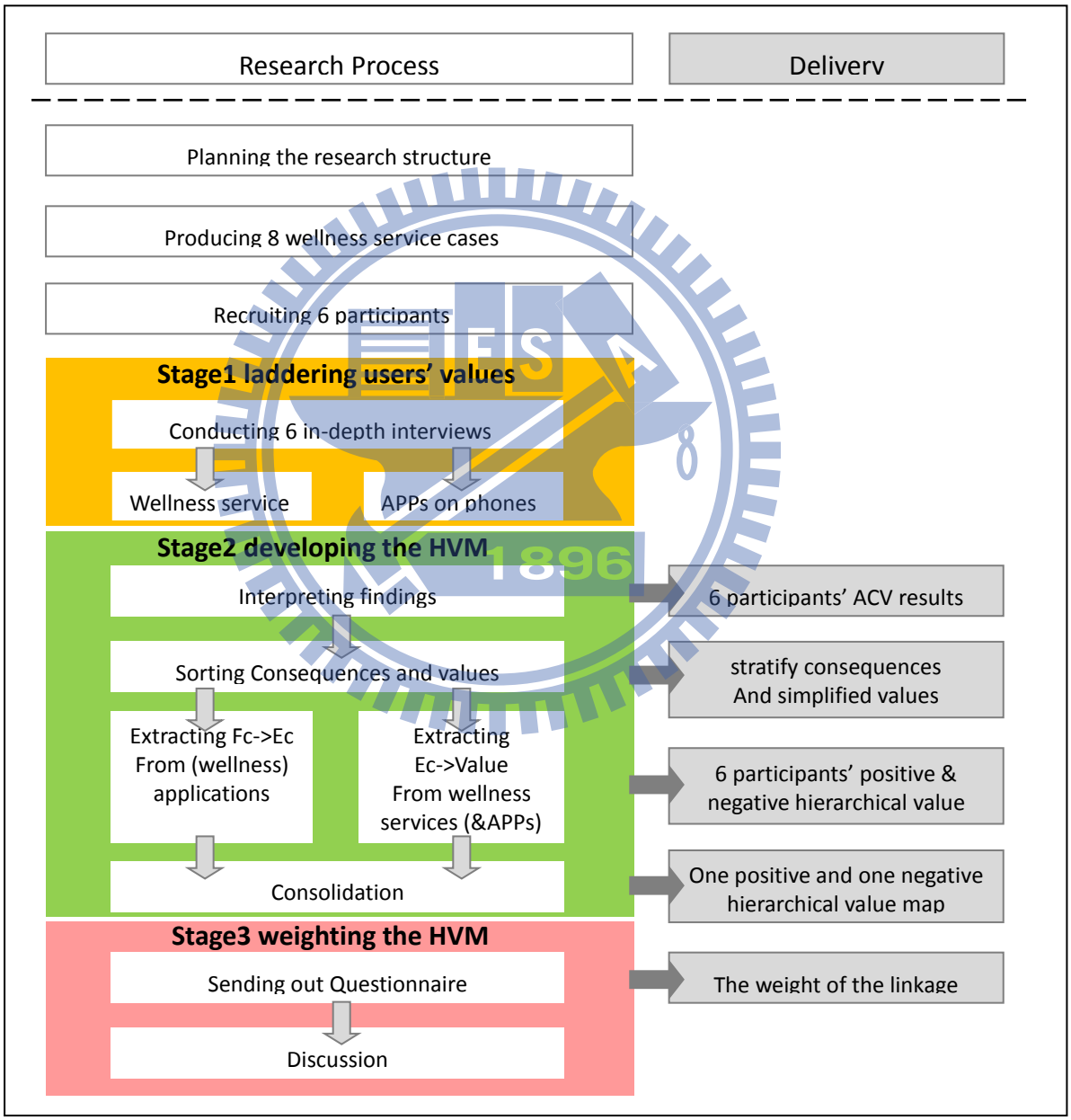


Figure 3-1 the research structure

3.2 Recruiting the research participants

Although smartphones are gaining popularity, but the diverse functions and the higher charges are not accepted by everyone. The group of age 20 to age 40, usually are financially independent, familiar with technology and receptive to new stuffs. Thus, the six participants are in this age interval, including three males and three females. They are all office workers and smartphone users, with regular exercise habits, such as jogging, cycling and ball playing. Three of them joined professional gyms before, and three of them used wellness applications on their phones. All of them are heavy users of APPs, who regularly check new applications at APP markets. Four of them have the experience of purchasing applications on line.

The six participants live in cities in Taiwan, and the educational level is relatively high, that they all have university diplomas or higher. Table 3-1 shows profiles of the participants.

	Gender	Age	Exercise frequency	Sport	Phone model
Participant1	Male	25	3/ week	Jogging, Badminton	Iphone 4
Participant2	Female	35	6/week	Walking, Mountain climbing	Black Berry 9520
Participant3	Male	25	2/week	Tennis, Basketball	Acer Liquid
Participant4	Female	32	1/week	Badminton	HTC Desire
Participant5	Male	27	5/week	Fitness, Biking	HTC Desire
Participant6	Female	27	2/week	Jogging, Yoga	Iphone 4

Table 3-1 participants profile

3.3 Conducting interviews to ladder users' values

The interviews were held during March to April 2011, each with an average length of 1.5 hours, and the interviews were formed up by three stages (shown in Fig

3-2).

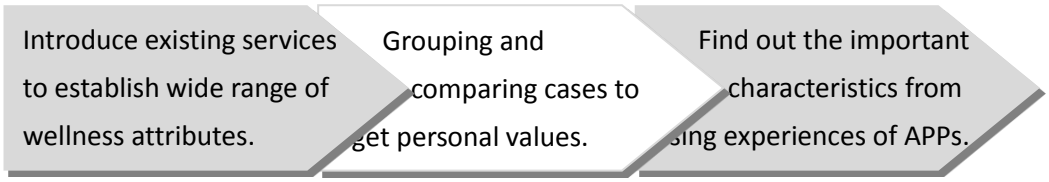


Figure 3-2 three stages of the interview

3.3.1 Introducing existing wellness services as attributes

First of all, we wanted the participants to express their attitudes toward wellness. But in the general situation, participants don't really realize what their values are, and also can't express them well without help.

Reynolds and Gutman (1988) proposed the Eliciting Distinctions, which elicit distinctions made by the individual participants concerning perceived and meaningful differences between products. Hence, the study adopted the method that interviewer introduced eight existing wellness services to participants, and emphasized their attributes, e.g. price, rules and facilities, to make sure that participants understand the services, and they can make choices between them according to values, even though they may haven't experienced before.

The eight service cases can be divided into four types, the type of Gyms that provides environment and facilities to take exercise, the type of Information Record that users can manage their wellness information by themselves or by the service automatically, the type of Detection that combine fitness with detecting movement by Balance Board or smartphones, last but not least, the type of Health Promotion that emphasizes on promoting health issues by some strategies to persuade people involve in. The eight services are shown as follows with their key attributes.

Gyms	
 **Taipei City Neihu Sports Center**	● Held by government. ● Charged by hours. ● Equipped with various types of sport facilities.
 **World Gym**	● A chain of gyms with bases all over in Taiwan. ● Annual fees. ● Fancy interior design style. ● Provide fitness classes, coaches and exercise equipments, also furnished by SPA, steam rooms and shower rooms.

Table 3-2 the type of Gyms

Information Record	
 **Nike Plus (Nike+)**	● A wellness application on smartphne. ● Workout data wirelessly sync to web portal. ● Sport stars' audio encouragements. ● Post t notification on Facebook. ● Deliver an avatar as your incarnation. ● Compete with friends' records online.
 **Smile Diet**	● A website helps to manage culinary. ● A food calories database established and updated by users. ● Edit how many calories you eat per day. ● Show the nutrient charts based on records.

Table 3-3 the type of Information Record

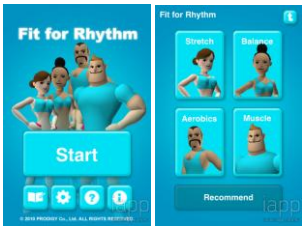
Detection	
 **Wii Fit plus**	● An exercise game using the Wii Balance Board. ● Register player profile with record. ● Measure weight and detect a person's center of balance.
 **Fit 4 Rhythm**	● A wellness application on smartphone. ● Virtual trainers assist 80 fitness exercises that 20 are free. ● Breaking the record and winning the prize as feedback.

Table 3-4 the type of Detection

Health promotion	
 **Newstart**	● A health promotion camp held by hospital.. ● Experiencing a series of health courses and physical checkup in a short term. ● Planned by doctors and dietitians.
 **Taipei Resident's Health Card**	● Delivered from city government. ● Use the card to collect health points and exchange for prizes. ● Free.

Table 3-5 the type of Health promotion

3.3.2 Interviewing with laddering skills

In the next pace, by using the case cards to elicit distinctions (see Figure 3-3), the interviewer asked participants to group the cases according to their personal views. After grouping, the participants would be asked to provide a preference order in each group and the reason why one particular service is their most preferred. The interviewer tried to find out why these characteristics were important to the participants by asking "Why is this important to you?". This would lead to an abstractive level and let the participants articulate certain consequences. When no further level of abstraction is possible, it would end up in a personal value.

For example:

Participant 1: I think "The World Gym" is better than "The Sports Center"

Interviewer: Why?

Participant 1: Because it is more expensive.

Interviewer: Why is the charge important to you?

Participant 1: Because the expensive one will be more effective.

Interviewer: Why it'll be more effective?

Participant 1: Because while taking exercise, the more fees it charges, the more efforts I make, so it'll be more effective.

Interviewer: Why effectiveness is important to you?

Participant 1: Because I care about the Cost-Performance Index. If I spend the money, it'd better be effective!

Figure 3-3 the situation of grouping and comparing the case cards

3.3.3 Sharing the APPs experiences

In the final stage, the study wanted to investigate the design factors of general APPs that could be adopted in the wellness. Thus, participants were asked to share their experiences about the use of applications. They showed their smartphones and presented several APPs, which were their favorite ones or commonly used. Again, the interviewer tried to find out important characteristics, laddering to consequences and personal values to gain the positive APPs experiences as a basis for further research in next chapter.

3.4 The requirement of proposed HVM

The purpose of this study is to provide an opportunity in the new developing environment that designers can apply as design strategy, which can help them to better determine target users' attitudes and needs in the new area.

The usual method employed as implication for value- based design is Means-End theory. The result, hierarchical value map (HVM), can ladder the existing product attributes to users' values, and help designers improve their previous design.

However, there aren't a lot of existing attributes in a new developed field, thus

designers can't gain comprehensive values from them. It's hoped that we can provide a proposed HVM, which can forecast important values that users may concern in the area that is new to them and in which they hasn't built up their corresponding values. Furthermore, the feelings that related to the values may be the specification that can apply as design implications.

After conducting interviews, we expect the proposed HVM in this study can tell the values that users cared in the wellness, and also the related feelings brought by consequences can be seen as design strategies in the wellness APPs. In addition, the influential weights on the linkages of proposed HVM, which can help designers making decision while design process, should be added too.

3.5 Summary

In this chapter, the study elaborated the conduction of interviews. 6 participants who are familiar with smartphone APPs and taking exercise regularly were invited to share their attitudes in the wellness and the experiences in the APPs. Besides, we advance the requirement of propose HVM that can be used in new field design for further discuss in the next chapter.

Chapter 4

Results

The study conducted interviews using the method of laddering in the previous process. Hence, this chapter shows the results, which includes three stages.

Firstly, build the HVMs for each participant to collate the data from interviews. Secondly, developing the *P-HVM,* which was consolidated to show the relations and weights between elements from different subjects and be useful in the new developed field. Lastly, functional, emotional consequences and values participants mentioned in the interviews are sorted to present their attitudes.

4.1 Building HVMs from interviews

After conducting the interviews, the study employed Means-end theory as method, which can help us analyze attributes, consequences and values from massive data, and suggested by substantial studies in attaining values, introduced in Chapter 2. The reflection of this method is to build up Hierarchical Value Map that shows relations between these elements.

4.1.1 Setting attributes

The interviews use two types of attributes, from wellness services and the existing applications on participants' smartphones, to obtain their viewpoints of health issues and APPs. However, the wellness services include two wellness applications, Nike+ and Fit 4 Rhythm, that they can depict the attributes in the

wellness, as well as in the applications. Thus, we extracted two wellness applications to be the third type of attributes (see Figure 4-1).

Figure 4-1 three types of attributes

4.1.2 HVMs from interviews

From the interviews, the study built up three different subjects of HVM for each participant, which includes two wellness APPs, six wellness services and other applications introduced by them, shown in Fig 4-1, 4-2 and 4-3.

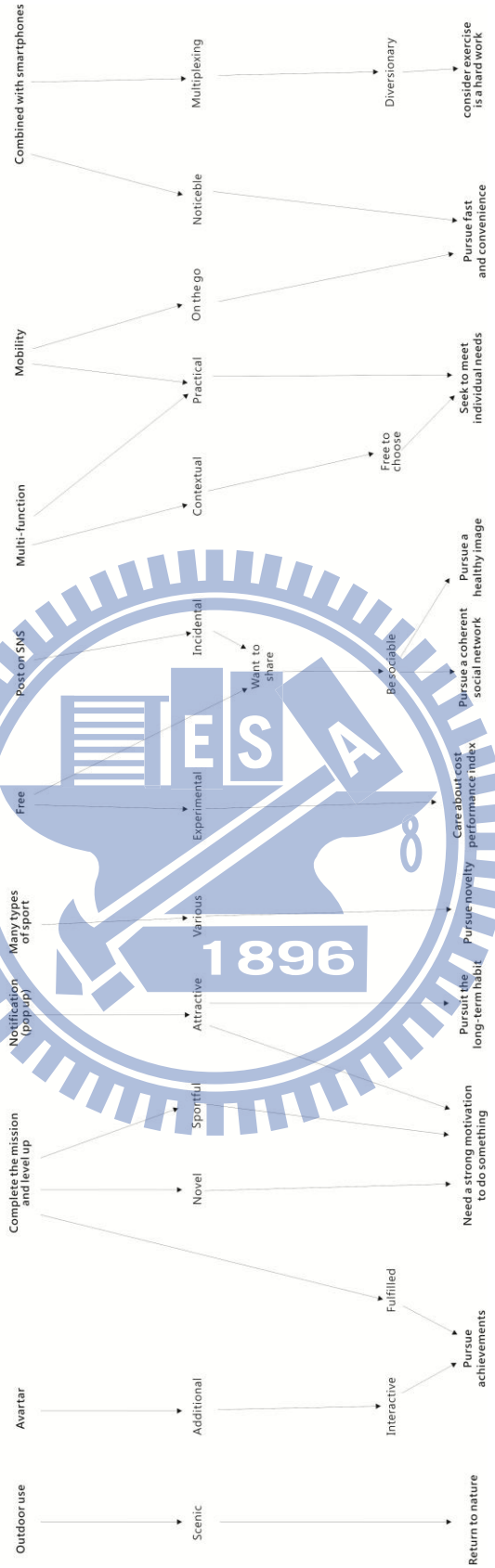


Fig 4-2 the HVM of two wellness APPs from participant 1

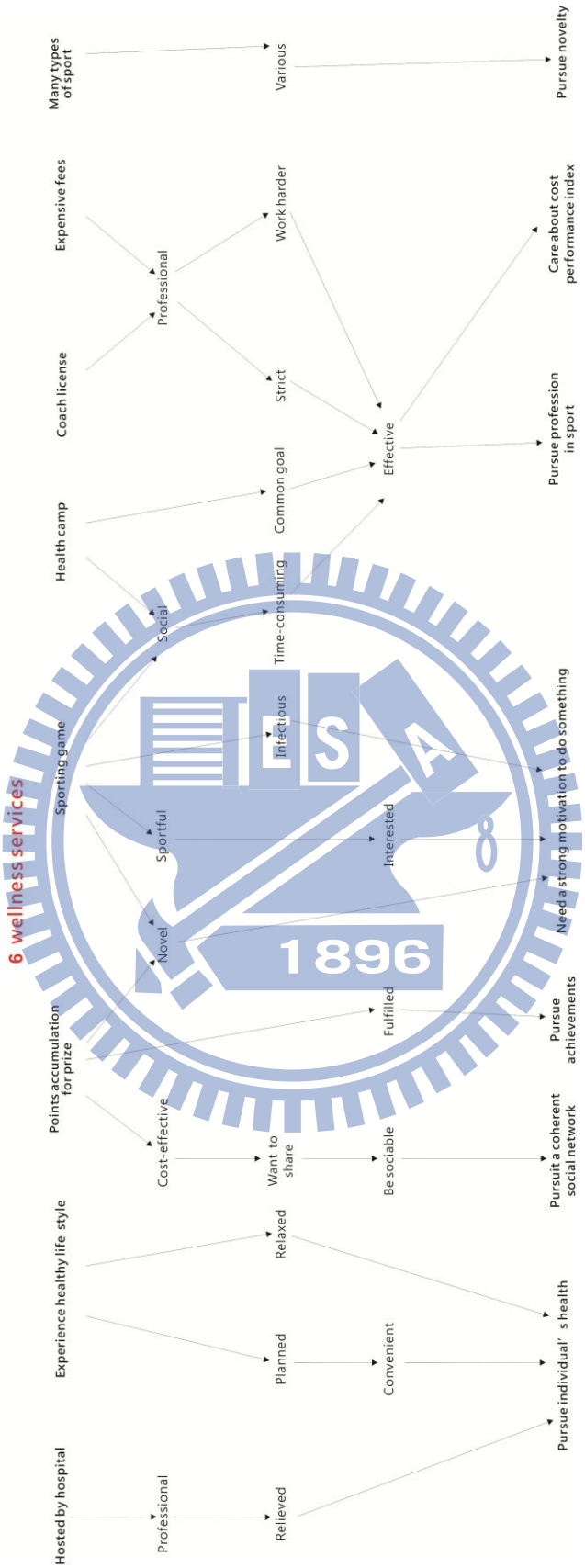


Fig 4-3 the HVM of six wellness services from participant 1

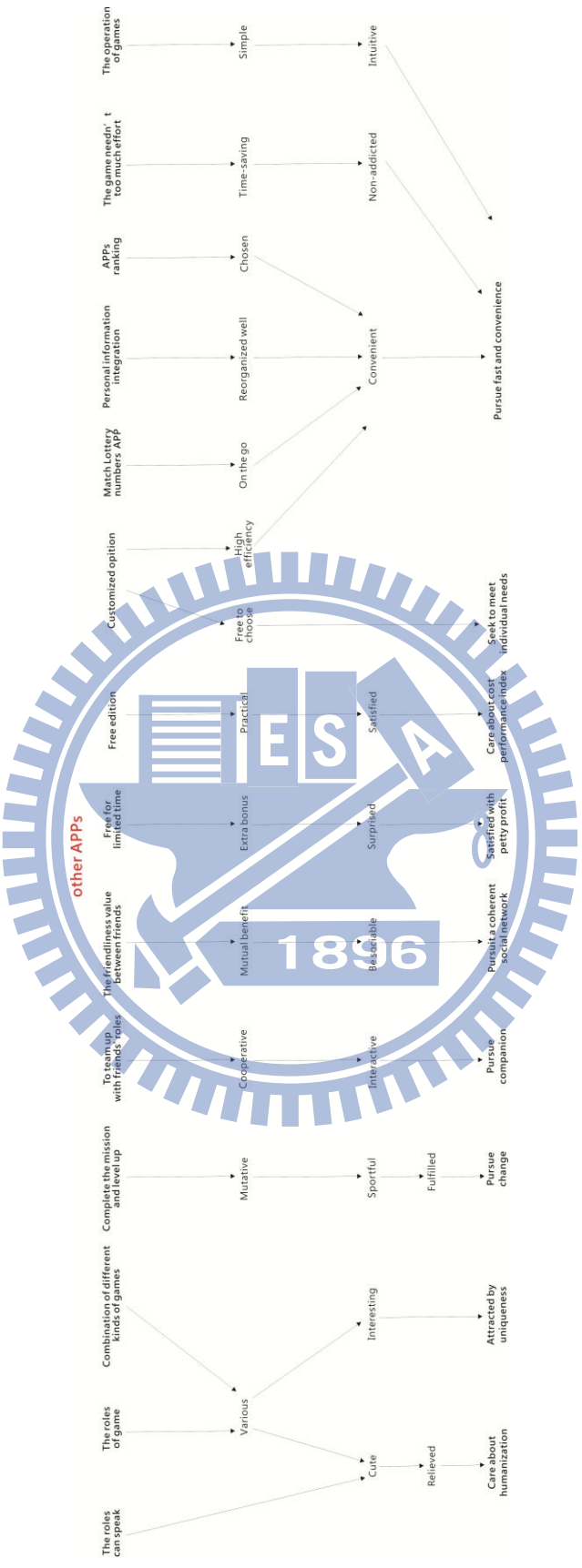


Fig 4-4 the HVM of other APPs from participant 1

4.2 Developing *P-HVM*

After building regular HVMs from the interviews, the study tried several methods by collating and arranging data from interviews to attain a proposed HVM that can help designers better determine target users' attitudes and needs, and carry out the corresponding design specification in this new area. The final suggested method is presented as follows.

4.2.1 Sorting consequences

As a result of numerous consequences mentioned in the interviews, it's often to see that participants used different consequences to describe a same feeling due to their personal idioms, and it would gain complexity and confusion in building HVM. Thus, the study sorted these consequences by their representing meanings, and picked a consequence as the representative of the group. Although Walker and Olson suggested the six levels in the means-end chain (see Table 2-2), the consequences attained from the interviews were not distinct enough to classify into six layers. Thus, we took their suggestion to classify all the consequences into two categories, on one hand, *the functional consequences*, illustrate the participants' feelings, affected by the attributes of services and applications. On the other hand, *the emotional consequences*, affected by functional consequences and be in response to participants' personal life experience.

Meanwhile, there were several negative feelings described during the interviews. We extracted these negative consequences, and did the sort and categorization too. In the end, the study would get a group of positive consequences and the other group of negative consequences, with both sorted.

Consequently, linking attributes, functional consequences, emotional

consequences and human values in a hierarchical order to rebuild the HVMs of each participants according to the results of interview (see Figure 4-5).

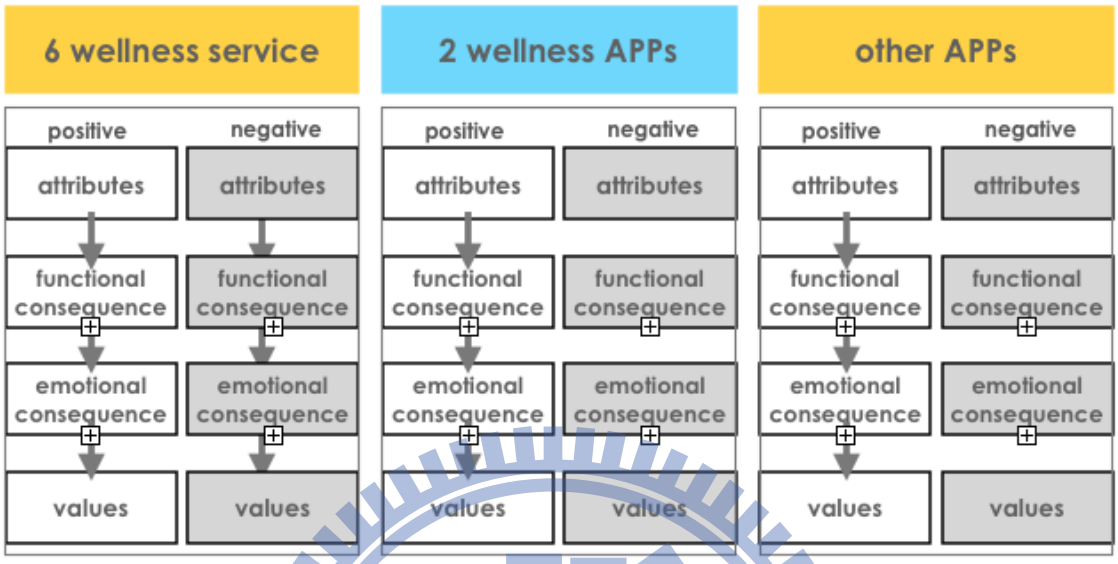


Figure 4-5 the HVMs of three subjects

4.2.2 Crossing the HVMs

On the previous stage, we got the HVMs in several contexts. According to the main purpose, the study wants to investigate values in the wellness and the feelings related to design factors from APPs. However, on the HVM of wellness services, the attributes are far from the context of applications, but the values linked from them represented the attitudes toward health issues. Hence, the study disregarded its attributes and functional consequences, but kept its emotional consequences and the linkages to values, which showed what participants pursue in the wellness.

On the HVM of other applications, the values are not acquired in the context of wellness, which are not the subject of the study, but the related consequences are derived from the attributes of APPs that we want to apply as design specification. Thus, we abandoned the linkages between emotional consequences and values, but

reserve the linkages between functional consequences and emotional consequences.

It is notable that the two wellness applications, Nike+ and Fit 4 Rhythm, are in the context of wellness and associated with applications. Thence, the study kept the functional consequences, emotional consequences, values and the linkages between them (see fig 4-6).

Lastly, we got different parts from these HVMs, which show context in the wellness or applications, but in a fragmented structure. The study wants to deliver a proposed HVM that can present not only wellness values, but also feelings associated with APPs in an integral framework that can easily understood and employed by designers. Hence, we assumed the common emotional consequences that showed up in all three HVMs as *Key Nodes* to consolidate the extracted parts from these HVMs and came out the proposed HVM, *P-HVM*.

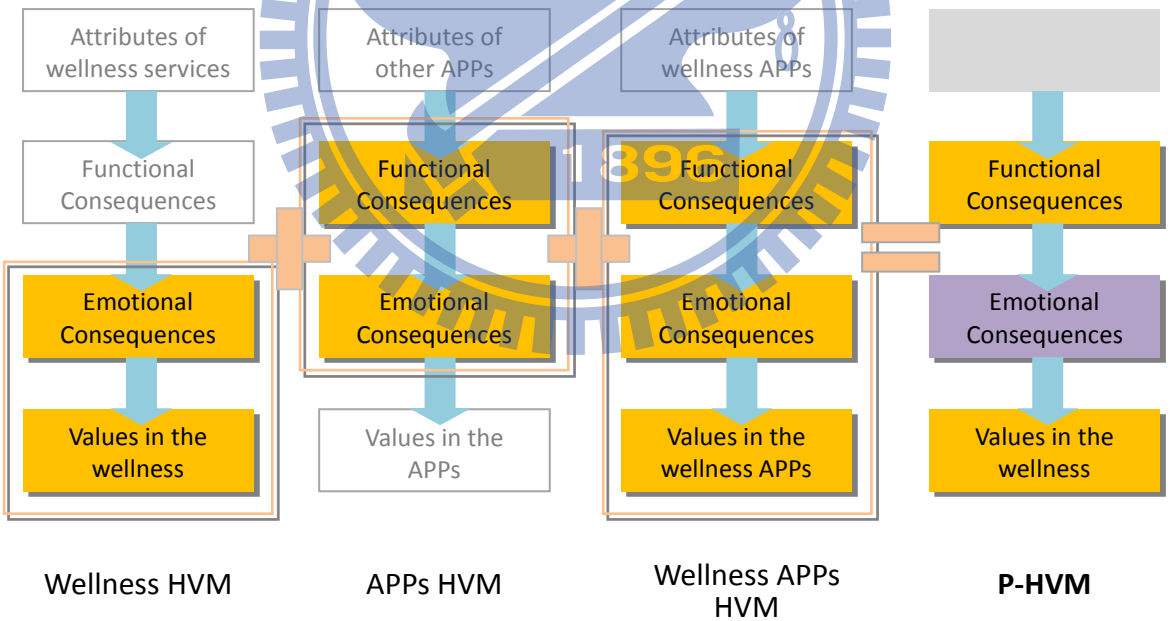


Figure 4-6 crossing the HVMs to attain P-HVM

The structure of *P-HVM* is shown in Fig 4-7, the linkages route from top to the lower layer (grey arrows), in addition, there are some links point to the elements in the same layer (grey loop arrows) before they point to the lower layer, which

describes the users' mental context in details. It's notable that we won't adopt attributes from any HVMs; on the contrary, we kept it for designers to employ corresponding design factors on the basis of lower levels in the *P-HVM*.

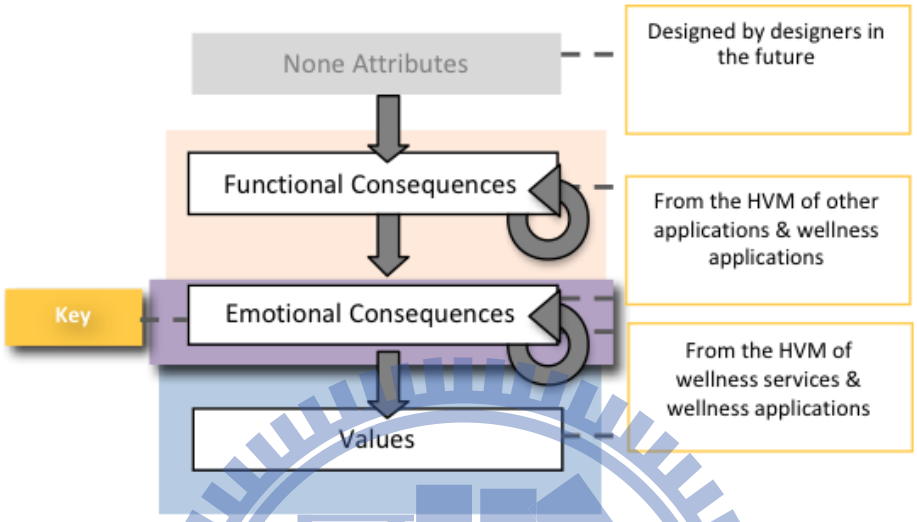


Fig 4-7 the structure of *P-HVM*

4.2.3 Weighting the *P-HVM*

After the consolidation of the *P-HVM*, the study found that several linkages point to the same nodes would confuse designers that which route is the more influential one links to the target value. Thus, we sent out questionnaire to bring out the weight of each linkage to help designers make trade-offs when they are struggled with design. For example:

Recorded (FC) -> Contextual (EC) -> Progress

Practical (FC) -> Accompanied (EC) -> Progress

These two ladders pointed to the same value, Progress, and gave rise to the consideration that which is more influential for pursuing progress. The two questions were delivered to get the answer:

- I think the wellness service involves in life context will help me in the pursuit of progress.

- I think the wellness service accompanied by friends will help me in the pursuit of progress.

There were total 139 questions in the questionnaire, each of them represent a linkage of multi-choices in the *P-HVM* like this. 83 participants selected the grading from “strongly agree”, weights 5 points, to “strongly disagree”, weights 1 point, according to their personal experiences and feelings toward the questions. The number of people chose the option multiply its weight would get the weight of the linkage.

In order to keep the *P-HVM* easy to interpret, the study calculated the average of the weights that point to the same node, and stressed the linkages that is above it, which means they are more influential to attain the end values. For example, the emotional consequence “Sharing” is pointed by the functional consequences “Fun” with the weight 307, “Various” with the weight 302, “Additional” with the weight 300, “Cost-effective” with the weight 328 and “Convenience” with the weight 317. The average of these five is 311, thus it’s notable that “Cost-effective” and “Convenient” are above it and more important than others (see Table 4-1).

EC\ FC	Fun	Various	Additional	Cost-effective	Convenient
Sharing	307	302	300	★ 328	★ 317

Table 4-1 the functional consequences related to “Sharing”

The emotional consequences that point to the value “Progress” are shown in Table 4-2. “Inspired” weights 349, “Fulfilled” weights 365 and “Corresponding” weights 350 are above the average 342. Thus, we can consider them first to attain the value “Progress”.

V \ EC	Accompanied	Inspired	Fulfilled	Corresponding	Contextual
Progress	319	★ 349	★ 365	★ 350	326

Table 4-2 the emotional consequences related to “Progress”

4.2.4 The *P-HVM* in the wellness

After consolidating all the consequences and values, and receive the weights on the linkages, we now can build up the consolidated *P-HVM* from the interviews. The *P-HVM* of value “Quality” extracted and shown in Fig 4-8, the darker and thicker arrows are the ones with the weights above average, which are more influential to attain the value. For example, the emotional consequence “Attractive” is more important than “Effective” when facing the value “Quality”. After routing from “Attractive”, we can be told that “Various”, “Fun” and “Contextual” are the suggested design specification for it rather than “Out of the ordinary” and “Occasional”.

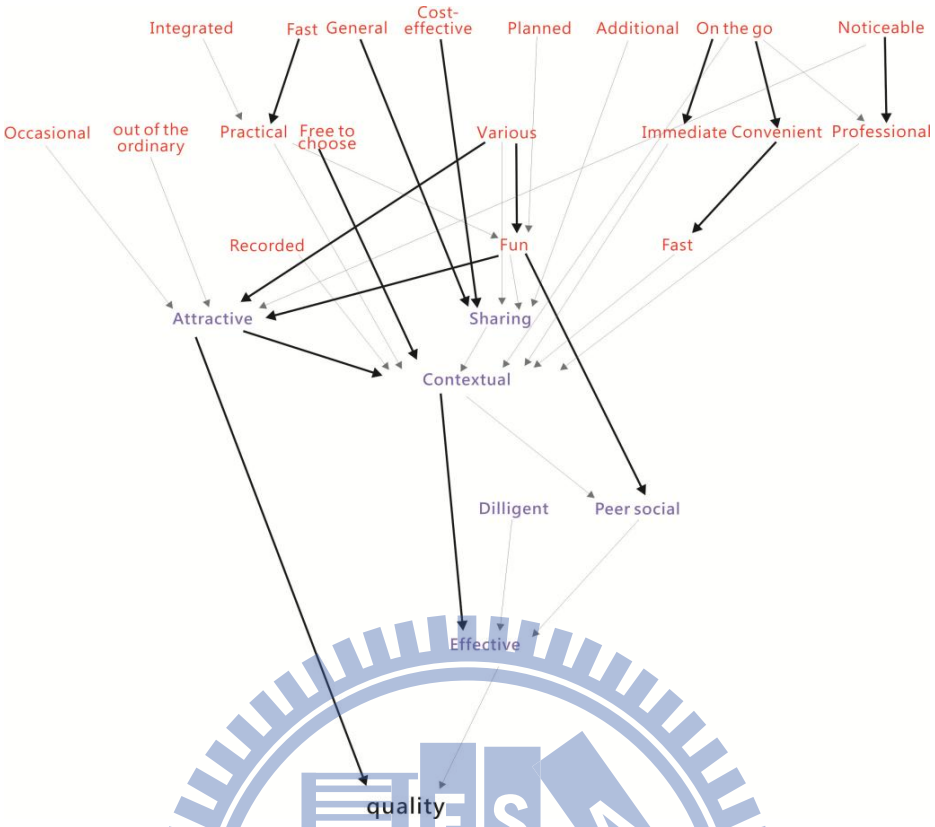


Fig 4-8 the HVM of value “Quality”

The *P-HVM* of value “Effectiveness” is shown in Fig 4-9. The route “Recorded -> Real -> Fulfilled”, “Practical -> Fulfilled” and “Various -> Fun -> Fulfilled” are more influential to get the target value “Effectiveness”, which can help designers make trade-offs when delivering a related design. There are total 17 *P-HVM* of the values in the wellness, shown in Appendix C.

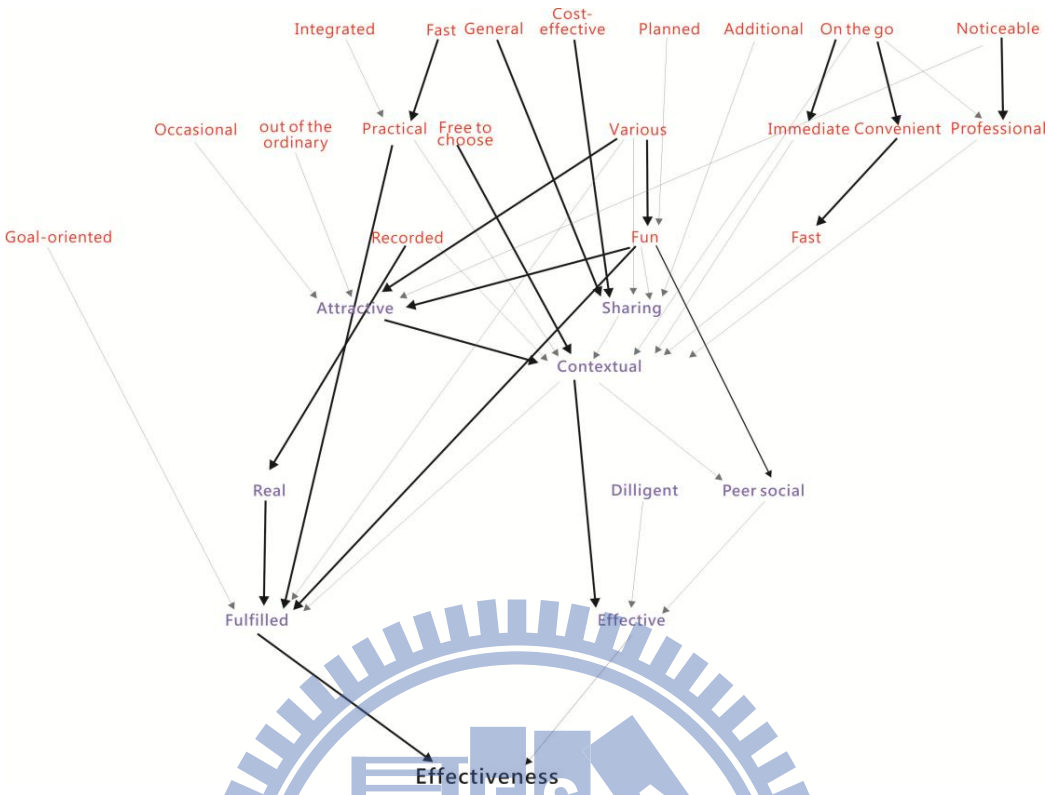


Fig 4-9 the HVM of value "Effectiveness"

4.3 Result

Since there was large number of consequences mentioned during interviewing, the study used affinity diagram to group those similar ones, and chose a representative among them to name the group. The consequences also can be sorted by the positive and negative emotions that they carry, which are shown as follows.

4.3.1 Positive Consequences

These consequences can be divided into two types, functional and emotional ones. The functional consequences are the feelings provided by products, and the emotional consequences that relate to user's personal feelings. The results of the

affinity diagram are listed in table 4-3 and 4-4. The columns in colors are the representative consequences and their matching codes, which represents the sub-consequences in the right column.

There are seven types of functional consequences in table 4-3. The type “The first impression on the service” shows immediate feelings when users know or use the products, and it includes three representatives, F1 Noticeable, F2 Fancy and F3 Fun. For the reason of concluding all the meanings, “Noticeable” is chosen as the representative of “Audio”, “Recognized well”, “Bright”, “Visual” and “Prompt”.

The first impression on the service.	**F1.**	**Noticeable**	Audio
			Recognized well
			Bright
			Visual
			Prompt
	F2.	**Fancy**	Cute
			Delicate
	F3.	**Fun**	Interesting
			Sportful
			Special
			Novel
The personal feelings about choices the services offer.	**F4.**	**Various**	Mutative
			Diversionary
	F5.	**Additional**	Supplementary
			Incidental
	F6.	**Integrated**	Multi-purpose
			Multiplexing
	F7.	**Free to choose**	Chosen
The personal feelings about functions the services offer.	**F8.**	**Practical**	Frequently used
			Widely used
	F9.	**Professional**	Referable
			Reliable
			Learning
	F10.	**Recorded**	
	F11.	**Planned**	
	F12.	**Convenient**	
	F13.	**Goal-oriented**	
The personal feelings about efficiency.	**F14.**	**Immediate**	Automatic
			Intuitive
	F15.	**Fast**	Time-saving
	F16.	**Cost-effective**	Bonus
			High efficiency
The personal feelings about occasions.	**F17.**	**On the go**	Anytime and anywhere
			Do without computer
	F18.	**Scenic**	
The relations with exercises.	**F19.**	**Out of the ordinary**	
Others	**F20.**	**Occasional**	
	F21.	**General**	

Table 4-3 the positive functional consequences

The emotional consequences are shown in Table 4-4. Similarly, the left column presents titles of the groups, the columns in colors are the representatives and their consequence codes, and the right column includes all sub-consequences.

The table includes six groups of emotional consequences. The type named “Others” is the one that can’t be classified into any previous groups. “The personal

feelings about efforts" presents the feelings when participants facing and dealing with efforts that they need to make, includes E11 Diligent, E12 Fulfilled and E13 Purposive.

The personal feelings about sociability.	**E1.**	**Sharing**	Want to share
			Infectious
	E2.	**Peers social**	Common goal
			Cooperative
			Competitive
			Mutual benefit
	E3.	**Accompanied**	Intimate
			Familiar
			Family social
			Be social
	E4.	**Interactive**	Feedback
	E5.	**Private**	
	E6.	**Personal**	
	E7.	**Topical**	
	E8.	**Inspired**	
The personal feelings about merit.	**E9.**	**Effective**	Worthy
	E10.	**Experimental**	
The personal feelings about efforts.	**E11.**	**Diligent**	Persistent
			Work harder
	E12.	**Fulfilled**	Achieved
			Aimed
			Satisfied
	E13.	**Purposive**	
The personal feelings toward the service.	**E14.**	**Attractive**	cool
			Funny
	E15.	**Surprised**	Surprising
			Expected
	E16.	**Relieved**	
	E17.	**Relax**	
	E18.	**Curious**	
	E19.	**Be corresponding**	
The personal feelings about involvement.	**E20.**	**Contextual**	Habitual
			Needn't re-learning
	E21.	**Different from habits**	
Others	**E22.**	**Real**	
	E23.	**Helpful**	
	E24.	**Mental**	
	E25.	**Non-demanding**	

Table 4-4 the positive emotional consequences

4.3.2 Negative Consequences

In the meanwhile, there are several negative consequences mentioned by participants, they also be classified into functional and emotional consequences, with the same title names of the positive ones.

For example, the positive functional consequence, “Professional”, in the group of “The personal feelings about functions the services offer” refers to participants like professional services that they can rely on. Relatively, there is a consequence, “Unprofessional”, in the group “The personal feelings about functions the services offer” of negative functional consequences, which shows that participants feel the service is unprofessional for the reason that they can’t learn things from it.

However, there is also a “Professional” in the negative group. Sometimes, the product or service is too professional for users that they will feel pressured. For example:

(Participant 6)

“I don’t like the function that we can compete with others. It’s too professional (NF5) for me and makes me feel pressured (NE9).”

The first impression on the service.	**NF1.**	**Sporty**	Masculine
	NF2.	**Ugly**	
The personal feelings about choices the services offer.	**NF3.**	**Additional**	No requirement
			Not necessary
			Searchable on the web
			Can be replaced by normal sports
The personal feelings about functions the services offer.	**NF4.**	**Unprofessional**	No learning
			No information
	NF5.	**Professional**	
	NF6.	**Hard working**	Too many efforts
	NF7.	**Hard**	
The personal feelings about efficiency.	**NF8.**	**Use in short term**	Limited by deadline
	NF9.	**Time-consuming**	High-frequency
	NF10.	**Occasional**	
The personal feelings about occasions.	**NF11.**	**Crowded**	All kinds of people
	NF12.	**Small screen**	
	NF13.	**Hardware limited**	Computer-based
	NF14.	**Burden**	Cumbersome
	NF15.	**Less convenient**	Location restricted
	NF16.	**Hard to access**	
The relations with exercises.	**NF17.**	**Diverge from taking exercises**	Nothing to do with sports
	NF18.	**Not practical enough**	

Table 4-5 the negative functional consequences

It's the same situation in emotional consequences. The feelings such as "Sharing", "Accompanied" and "Peer social" in the group "The personal feelings about sociability" bring positive senses to participants. On the contrary, if there are too much or too little sociability in a service, participants may have negative feelings.

(Participant 6)

"I don't like the function of posting what I am doing on SNS, because usually I get no response from my friends (NE6)."

(Participant 2)

"The sporting game has a lot of devices that you need to stay home to use it, thus it's kind of family social (NE7) that you have to be participatory (NE5)."

The personal feelings about sociability.	**NE1.**	**Social**	
	NE2.	**Interactive**	
	NE3.	**Unfamiliar**	
	NE4.	**Not private**	Public
	NE5.	**Participatory**	
	NE6.	**No response**	
	NE7.	**Family social**	
The personal feelings about merit.	**NE8.**	**Ineffective**	No effect
The personal feelings about efforts.	**NE9.**	**Pressured**	Under pressure
	NE10.	**Accomplished**	
The personal feelings toward the service.	**NE11.**	**Annoying**	
	NE12.	**Awkward**	
	NE13.	**Old**	Ill
	NE14.	**Restricted**	Inflexible
	NE15.	**Not attractive**	
	NE16.	**Unaffected**	
	NE17.	**Not corresponding**	
The personal feelings about involvement.	**NE18.**	**Be interrupted during the exercise**	Hard to be focus on a single one
	NE19.	**Out-of context**	Out of the ordinary
	NE20.	**Habitual**	
	NE21	**Lazy**	

Table 4-6 the negative emotional consequences

4.3.3 Values

There are 17 values concluded from interviews, shown in Table 4-7. The column in colors contains representative values with their codes, and their sub-values, which are presented in the right column. For example, “Long-term habit” represents “Integration of usage and life context” and “Meeting individual needs”. Participants who mentioned them are seeking for taking exercise as a long-term habit, and they ended up at these sub-values while laddering during interviewing. .

In addition, there are corresponding and contradictory relations between V5 “Strong motivation to do something” and V16 “Already have strong motivation to take exercises”, as well as V3 “Profession in sport and health” and V15 “Efficiency but not profession in sport”. Because the values in a union are mentioned by different participants, who have different life experiences cause their different viewpoints.

Thus, the study brought up the questionnaires to get the weights of the linkages in the next stage.

V1.	**Long-term habit.**	Integration of usage and life context.
		Meeting individual needs.
V2.	**Progress.**	Practice.
		Self-discipline.
V3.	**Profession in sport and health.**	Comprehensiveness in health management.
		Individual's health.
		Perfect figure.
		Profession in health management.
V4.	**Novelty**	Enjoyable experience.
		Taking exercise in the joy.
V5.	**Strong motivations to do something.**	Greater motivation.
		Considering exercise is a hard work.
V6.	**Image conscious.**	Healthy image.
V7.	**Effectiveness.**	Seeing believes.
V8.	**Privacy and security.**	
V9.	**Coherent social network.**	Pop culture.
V10.	**Return to nature.**	
V11.	**Fast and convenience.**	
V12.	**Cost performance index.**	
V13.	**Quality.**	
V14.	**Achievement.**	
V15.	**Efficiency but not profession in sport.**	
V16.	**Already have strong motivation to take exercises.**	
V17.	**The right to choose.**	

Table 4-7 the values in the wellness

4.4 Summary

The study presents the result of interviews in this chapter. The consequences and values are sorted and built up as Hierarchical Value Maps. According to the context of wellness applications, the parts of HVMs from different subjects are extracted to cross, and added with the weights from questionnaires, to combine into the *P-HVM.*

Chapter 5

Discussion

In the previous chapters, by conducting interviews using the technique of laddering, we built the basis knowledge of participants' attitude toward wellness and the feelings related to these personal values, and then combine these elements to bring out the proposed HVM, *P-HVM*, which contained the values from the field of wellness and the consequences from the field of applications. In addition, in order to get the suggested selection according to the aim of design, the study sent out the questionnaires to attain the weights on linkages of the *P-HVM*.

In this chapter, the study brings up the discussion from three aspects: (1) the values cared by users and the consequences that can satisfy these demands. (2) The guideline of conducting the HVM crossing includes rules and restrictions. (3) The study uses an example to give direction of using the *P-HVM* for helping design.

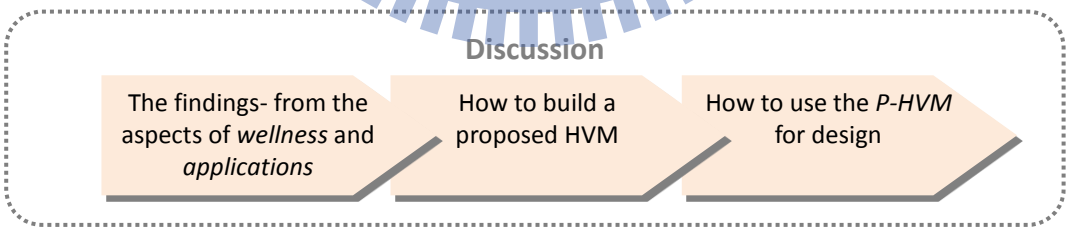


Fig 5-1 three aspects of discussion in this chapter

5.1 Users' values in the wellness

There are 17 personal values investigated from previous stages. The study divides it into 4 types, which are "The gradual progress in the wellness", "The

efficiency in the wellness", "The motivation can lead to better performance in the wellness" and "The quality in the wellness". The values table is shown and explained as bellowed:

The gradual progress in the wellness.	Long-term habit
	Effectiveness
	Progress
	Achievement
The efficiency in the wellness.	Profession in sport/health
	Efficiency but not profession in sport
	Right to choose
	Cost performance index
	Fast and convenience
The motivation can lead to better performance in the wellness.	Strong motivation to do something
	Already have strong motivation to take exercises
	Novelty
	Coherent social network
	Image conscious
The quality in the wellness.	Quality
	Privacy and security
	Return to nature

Table 5-1 Values table

5.1.1 The gradual progress in the wellness

In this group, it tells that participants want to consider involving in physical activities as a long term habit. They think they can receive much effectiveness from taking exercise regularly and persistently

[Quote 01] Participant 3: *"The free service attracts me to stay in it for a long run that can cause effectiveness and make me persistent."*

Once participants involve in physical activities, they want to see progress, they want to feel that they are getting better, which makes them achieved and accomplished.

[Quote 02] Participant 3:*"The sociability in the service can inspired me to do the best when I am taking exercise, which can help me getting progressive."*

[Quote 03] Participant 3:*"If the level of the sporting game is too hard to complete, it'll be annoying, and I'll feel frustrated that fail to achieve the aim."*

According to the introduction in Chapter2, several studies have noted that designers should consider the question "Did users perceive the usage as good experiences?" when delivering the design. This type of values lends support to that idea.

Along with the progress, users will attain achievement, which makes them fulfilled and perceive the whole experience is useful and pleasing, and build it as psychology values in minds. Next time, when users facing the similar context, they will recall the experience, in order to attain the values, they may encourage themselves to try again. The whole process will form as a cycle, and thus, users may develop it into a long-term habit.

5.1.2 The efficiency in the wellness

In this group, participants perceive moderate profession and restriction, good cost performance index, as well as convenience are ways to pursue efficiency in the wellness.

In detail, Participants think the services which can learn some health knowledge or host by doctors, coaches and dietitians are more professional and reliable. But somehow, some female participants point out that if the service is too professional, it'll make them feel pressured or becoming masculine.

[Quote 04] Participant 4:*"I think go to the gym using its facilities and guided by*

coaches is more professional than playing sporting games, I don't believe that sporting games are effective."

[Quote 05] Participant 6:*"I think the service is competitive, but it's too professional to me that I'll feel pressured."*

Although participants trust profession, they still want to have right to choose what they want to meet personal needs.

[Quote 06] Participant 4:*"The service is already planned that I can't skip what I don't have interests. It makes me feel restricted. "*

All the participants care about cost performance index of a service. If they spend more money, they'd expect they can get effectiveness more efficiently from the service, such as getting slimmer as soon as they can. They also take convenience as a matter to increase efficiency, such as taking exercise anytime anywhere, which can make work out become faster and easier to access.

[Quote 06] Participant 4:*"Because I care about cost performance index, I'll be more diligent to get effectiveness."*

[Quote 07] Participant 7:*"Taking exercise by phone is really into my life context. If I can access it easily, then I won't be lazy doing it, so it can increase efficiency."*

The type of values support the claim, reported above in Chapter1, that technological devices and applications can act as persuaders on wellness promotion domain.

The three aspects of mobile computing proposed in Chapter 2 add the supplement for it. Firstly, the mobile communication can send information data instantly, which can satisfy the values of fast, convenience and efficiency. Secondly, mobile hardware provides diverse functionalities, such as storage, processing capabilities and multimedia can deliver immersive instructions that are more professional than traditional web portals. Lastly, mobile software in the APPs market

gains chances for users to experience and choose from, which meets the value of cost performance index.

5.1.3 The motivation can lead to better performance in the wellness

A lot of studies documented that being physically active requires motivations (Arteaga et al., 2010). We also got this information from our interviews. Participants commented that taking exercise is a hard work, so they need motivations to push themselves work out. Pursue novelty will make them assume the physical activity is not hard, it's something enjoyable, attractive and lure them stay in it.

[Quote 08] Participant 2:*"The reason that obliges me to take exercise is considering my health situation. I want to reduce weight to keep healthy and slim."*

[Quote 09]Participant 4:*"I think taking exercise by my phone is really novel, and make me feel curious about it. And it'll be a motivation to try it."*

The service combined with social activities is also a way to increase participants' motivation, in which they can feel accompanied and interactive. Moreover, they can build young, cool and healthy images through sharing with friends.

[Quote 10] Participant 5:*"I think sharing the information that I'm working out with my friends and get some encouragement can be very interactive, and also help me build a cool and healthy image."*

Sometimes the participants already have regular exercise habits that they don't need strong motivations to push themselves. In this situation, they consider the services with too many fancy functions are out of context of taking exercise.

[Quote 11]Participant 5:*"I think the functions "avatar" and "complete the mission and level up" are additional and out of context, because I already have the habit, and don't need any strong motivation to press myself."*

This type of values likewise appeared in the definition of wellness in Chapter2. Adams et al. (1997) conceptualized wellness from a systems perspective, includes the social dimension that one will keep friends and families in his relationships, and support each other to attain secure self-identity and learn the meaning and purpose of life. Furthermore, Forlizzi and Battarbee (2004) proposed that fun and joy of use is now recognized as good user experience. Hence, combining sociability and enjoyment can be the motivation to involve in the wellness, which also meets the conclusion from Jääskö and Mattelmäki (2003), personal motivation, attitudes and values having influence in the user experience.

5.1.4 The quality in the wellness

The participants in the study are all economic independent. Thus, while speaking about charges, they think the quality is more important than the price. They also think the service with higher price deliver better quality and bring them privacy and security.

[Quote 12] Participant 4: *"I think sport center is crowded, without privacy and facilities aren't maintained well. I'd rather spend more money on World gym with higher level."*

Although indoor gyms are more comfortable and set up with professional facilities, participants still prefer outdoor sports. They enjoy scenery and fresh air, which make them getting close to nature.

[Quote 13]Participant 1:*"I really enjoy jogging along the riverside that I can listen to the voice and seeing the scenery of nature."*

The value about quality was discussed by Renger et al. (2000) in Chapter 2. They indicated environmental wellness as the impact on and balance between nature and

community resources. It explains people's instincts of pursuing nature and seeking for privacy and security to feel relax and relieved.

Through the conclusion of values from our study, we can know that users pursue progress and efficiency from different types of motivations, and enjoy the quality of wellness living style. In sum, these values are emerged to pursue a good user experience.

5.2 Consequences as design opportunities for wellness APPs

As can be seen from the Affinity Diagram of our study, there are some functional and emotional consequences can be applied as design opportunities and specification for attributes consideration, which are discussed as follow.

5.2.1 The functional consequences

There are seven types of functional consequences in the table 5-2. In "The first impression on the service" describes the impression that service brings to participants, which usually very impressive to catch attention.

[Quote 01] Participant 2: *"The audio beep is noticeable that can remind me to check the new message."*

The second type "The personal feelings about choices the services offer" indicates the types of choices preferred by participants.

[Quote 02] Participant 3: *"The APPs provides all the functionalities that you'll need to track your route are integrated and practical, and you can choose what meets your need."*

"The personal feelings about functions the services offer" is the third type,

which refer to the feelings related to functionalities, such as “Practical”, “Professional” and “Recorded”.

[Quote 03] Participant 2: *“The wellness APPs combine with smartphones can detect the movement is really high-tech and professional.”*

“The personal feelings about efficiency” represents the fourth type. Participants care about the efficiency of the APPs, and pursue the feelings of “Fast”, “Immediate” and “cost-effective”.

[Quote 04] Participant 2: *“The statistical result of the APPs shows up immediately. It will help me a lot”.*

The fifth type, “The personal feelings about occasions” presents that participants admire the feelings “On the go” that delivered by smartphones. Besides, using them in outdoor can bring the feeling “Scenic”.

[Quote 05] Participant 1: *“I can use the wellness APPs on the go, which can save my time.”*

[Quote 06] Participant 1: *“Outdoor use can make me the scenic view, and encourage me pursue nature.”*

“The relations with exercises” describes the relation between APPs and taking exercise. Surprisingly, participants feel that if an APP is “out of ordinary”, it’s more attractive.

[Quote 07] Participant 1: *“The wellness APP is really out of ordinary that make me forget the hard working of exercise and keep doing unconsciously.”*

Last but not least, the “Other” type instructs the ones that can’t be divided into any other groups. Participants feel the APP is “Occasional” used is novel and attractive, and the smartphones nowadays are “General” can help to share experiences between friends.

[Quote 08] Participant 7: *“I use the APP occasionally, and that can keep my curiosity*

toward it."

[Quote 09] Participant 6: *"Smartphones are general nowadays, thus it can help me share things with other friends who are the users too."*

5.2.2 The emotional consequences

There are six types of emotional consequences in the table 5-3. The first type of emotional consequences, "The personal feelings about sociability" describes all the feelings brought from social networks. "Sharing", "Interactive", "topic", "Accompanied" and "inspired" are the positive feelings that arise between communities. However, "Private" and "Personal" show the privacy that participants seek during the sociability.

[Quote 01] Participant 7: *"Friends' encouragement during taking exercise makes me fell accompanied and inspired."*

[Quote 02] Participant 2: "Go to gym with friends can make me feel the peer social, and still keep the privacy."

The second type, "The personal feelings about merit" characterize the feelings about the result that participants expect after working out. They pursue the "effective" consequence, and are willing to try the "experimental" usage.

[Quote 03] Participant 7: *"I'll be encouraged by accumulating healthy points to work harder; I will experience the effective consequence through this process."*

[Quote 04] Participant 2: "The free wellness APPs can make me feel experimental through the using experience."

"The personal feelings about efforts" is the third type of emotional consequences. It depicts the feelings when participants facing the efforts they need to make, such as "Diligent", "Fulfilled" and "Purposive".

[Quote 05] Participant 6: *"I'm very diligent to achieve the goal that I set, and be fulfilled when completing the mission."*

The next type, "The personal feelings toward the service", includes emotions brought by services, such as "Surprised", "Relieved", "Relax" and "Curious".

[Quote 06] Participant 6: *"Outdoor use makes me feel relaxed and getting close to the nature."*

[Quote 07] Participant 2: *"The idea that taking exercise by smartphones makes me surprised, because I never thought before."*

"The personal feelings about involvement" is the fifth type. Some participants accept the services involve in their life context; others prefer the ones that differ from habits.

[Quote 08] Participant 4: *"The service offers the function matches my exercise habit is really contextual to me."*

[Quote 09] Participant 6: *"The wellness service that is different from habits can help me improve my insufficient skills in the sport."*

Last but not least, the "Other" type instructs the ones that can't be divided into any other groups.

[Quote 010] Participant 6: *"Jogging outdoors brings me a period of silent time that is mental and relaxed."*

[Quote 11] Participant 4: *"The service integrates diverse functionalities is helpful to me."*

[Quote 12] Participant 2: *"The calories chart brought up by the wellness APPs make me experience getting slimmer and healthier, it's real."*

[Quote 13] Participant 2: *"Combine services with smartphones make wellness promotion easier and non-demanding to users."*

5.3 A design method with *P-HVM*

The proposed Hierarchical Value Map, *P-HVM* presented in the study shows designers what users really care before they begin designing. By referencing the related consequences, they can easily apply design factors to meet users' value. The structure and guidelines for building it are discussed as follows.

5.3.1 The structure of the *P-HVM*

The structure of this study started with the attributes from existing wellness service cases, and then conducted interviews with laddering skill to get participants' personal values. After getting the wide personal values, we restructure the HVM to combine the part of emotion, from wellness and wellness applications, with the part of function, from existing applications and wellness applications, and left attributes blank that let designers apply corresponding design factors into it in the design process. We call this a *P-HVM* (shown in Fig 5-2).

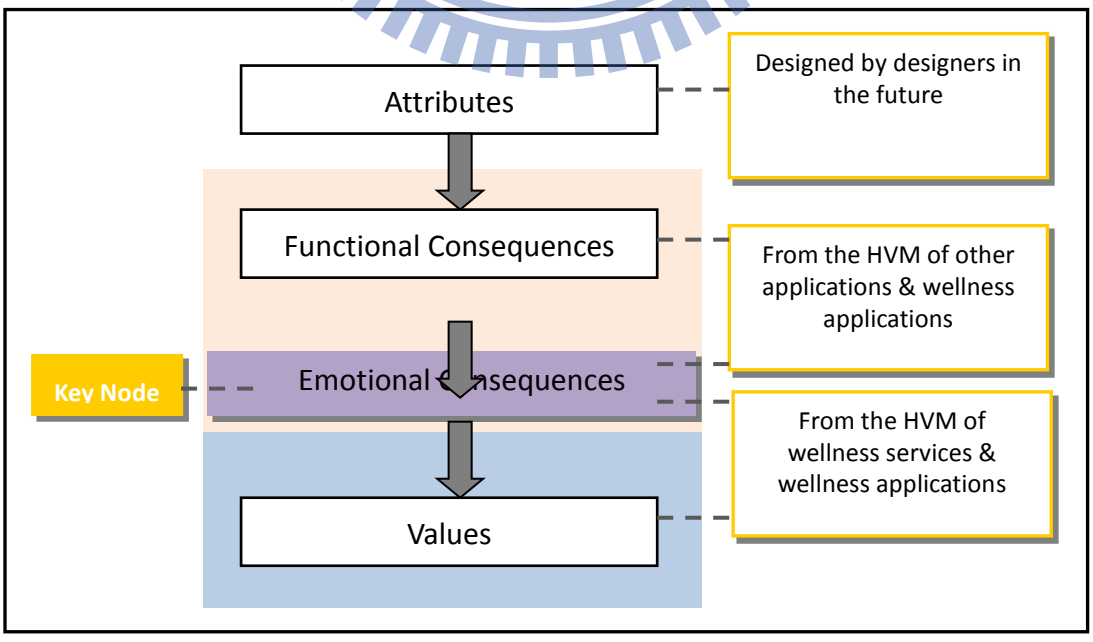


Fig 5-2 the structure of *P-HVM*

According to previous studies, Leitner et al. (2008) conducted the same theory to identify users' values toward multimedia from the existing attributes, as well as Abeele and Zaman (2009) attained users' value and the satisfied attributes of video game controllers by starting laddering from the functional consequences presented by users. Both of them show that laddering helps designers understand how concrete product attributes benefit personal values for end users (see Fig 5-3), but they can't figure out the values that aren't delivered by the products.

In our method, the study considers the multi-faceted values first, and links them to the feelings that can be provided by concrete product attributes, which make designers catch overall values of users, and won't limited by a single product. The more comprehensive values we can get, the more relative feelings can be presented, and the more users' needs can be found and be satisfied.

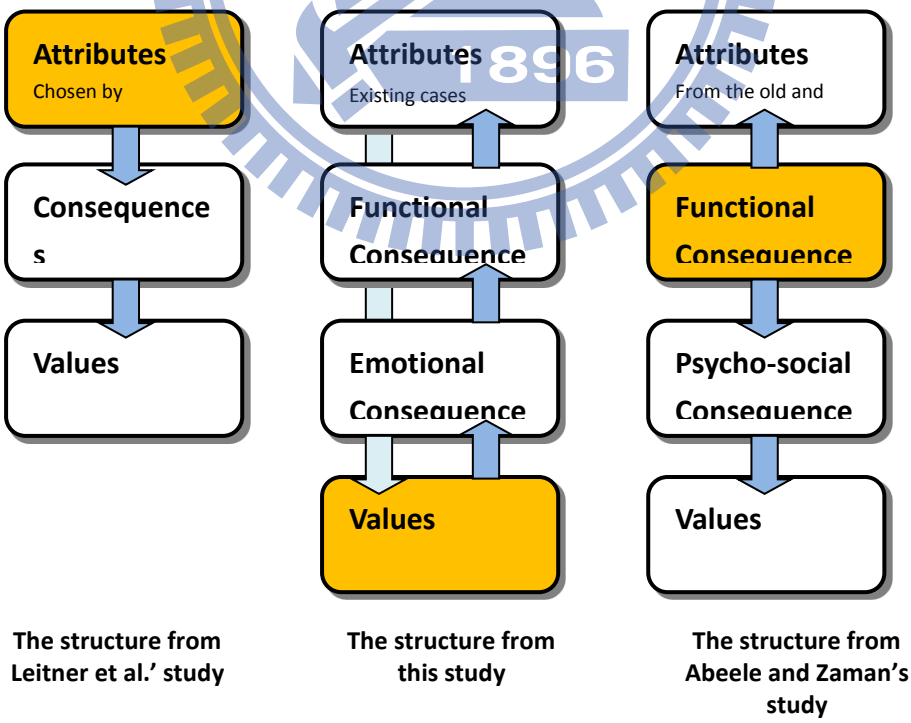


Fig 5-3 the comparison of the structures

5.3.2 The guidelines of conducting the process of HVM crossing

There are 5 steps in our method to attain the proposed HVM used for design. The following are the guidelines (2 don'ts and 7 do's) for application design by drawing from the method.

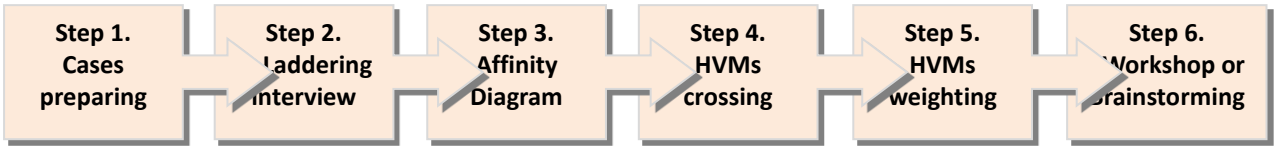


Fig 5-4 steps of conducting a *P-HVM* for design

step1. Cases preparing

Before conducting interviews, designers should prepare some existing cases from the field of target design as the attributes for laddering.

The cases should be diversified that can lead to wide-ranged values (Do's - 1)

To get the diverseness of personal values, designers shouldn't limit the varieties of attributes. On the contrary, we should diversify the types of cases.

step2. Conducting interviews by laddering skill

There are three stages in the interview. In stage one, designers introduce the prepared cases that related to target product for participants. In stage two, participants group the cases by their percept, and designers try to keep asking them to compare and explain the reasons of preference order to attain personal values. Then, stage three, after the comparison; participants start to present their favorite applications on their phones. Similarly, designers repeat the same process of stage two to get the laddering of these applications.

Designers should prepare case cards to help introduce the cases (Do's - 2)

There will be several cases introduced by designers. If there doesn't have any tools help participants memorize the characteristics of these cases, they can't do well on the stage of grouping and comparing. Thus, designers should prepare case cards with the pictures and main attributes on them.

Not every chain can end up in a value, but always give a try (Do's - 3)

Sometimes participants can't express their feelings very clearly, and sometimes they just refuse to open out due to the privacy. Designers should explain the aim of the research in the beginning to ensure participants' privacy, and help them express themselves by changing the way of asking.

Don't pre-set the type of applications that presented by participants (Don'ts – 1)

Designers can't forecast the applications that participants want to present, there always have some surprising findings through the interview, and it can be an opportunity for your design. So don't expect and pre-set the type according to the product you are designing for.

Encourage participants share the negative feelings about the applications (Do's - 3)

There are few negative feelings expressed in the stage of presenting the applications on participants' phones. They always focused on how much they love the application, and ignore that it still has some weak points can related to negative consequences. So, don't forget to lead them to share shortcomings actively.

step3. Sorting consequences by Affinity diagram

After conducting interviews, designers should take actions on integrating consequences before laddering.

To do the Affinity diagram to systematize all the feelings (Do's - 4)

Designers will get a lot of consequences from interviews. The best way to systematize these feelings is to do the Affinity diagram, which sorts the feelings by considering their meanings, and picks one from a group as the representative for the next step. Sometimes, if there are too many kinds of values in similarity, we do the sorting for them too.

Too many layers of consequences bring complexity to the study (Don'ts - 2)

After sorting all the feelings, designers should consider how many layers it will have in a ladder. We suggest applying two layers for functional consequences and emotional consequences are the best.

Instead of the suggestion of six levels in the means-end chain from Walker and Olson's (see Table 2-1), we combine abstract attributes and functional attributes into the layer of functional consequences, which represents the feelings that provided by products, and extract psychological consequence and instrumental value as the layer of emotional consequences to present feelings related to users' percept. For the reason that you need to restructure the massive resources from two different HVMs in the next step, two layers for consequences is a preferred and easier structure.

Step 4. Crossing the HVMs

Designers should deal with three HVMs from different subjects in the process of attaining proposed HVM, *P-HVM*, for application design. One is from the field that

you are designing for; in this case, it's the HVM of wellness from the wellness service cases we prepared. The second one is from the applications you aim to, for example, we picked two existing wellness applications in this study. The last one is the HVM of applications that participants shared during interviews (see Fig 5-5). At the same time, you can also build a set of negative HVMs as reference for design.

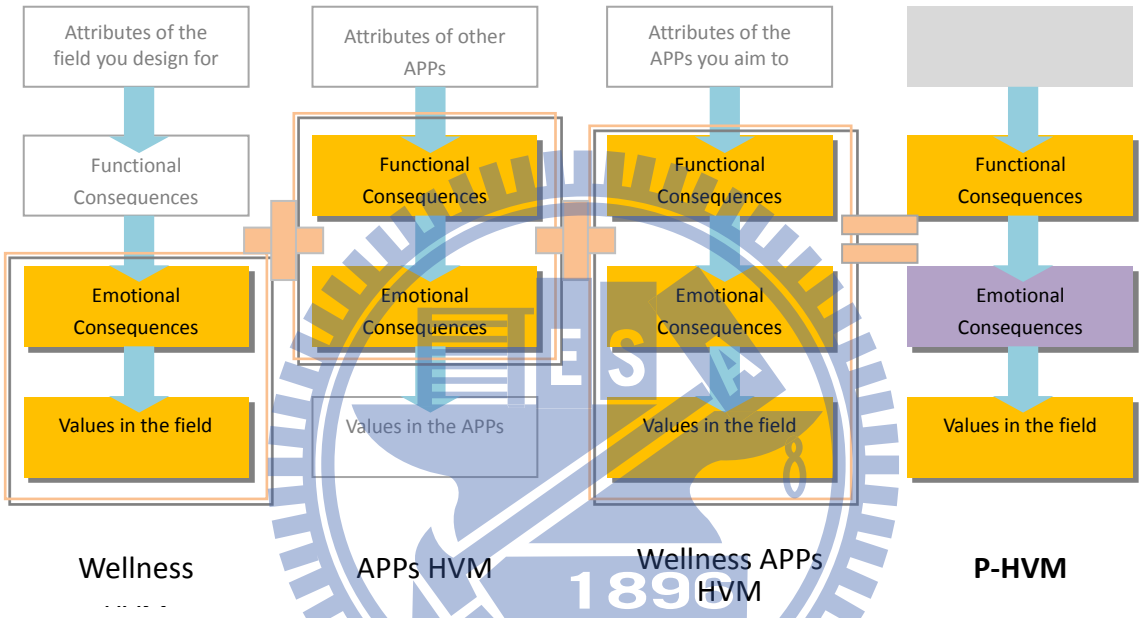


Fig 5-5 the process of HVMs crossing

Crossing the HVMs by emotional consequences (Do's - 5)

Since the functional and emotional purposes presented in chapter 3, designers should extract the part of "Emotional consequences -> Values" of HVMs, which belong to the aimed field cases and applications, and extract the part of "Functional consequences -> Emotional consequences" of HVMs, from applications presented by participants and the applications of aimed field designers prepared. In addition, use the emotional consequences repeatedly show up in both extractions as *key nodes* to combine two parts together as a *P-HVM* for design (see Fig 5-5).

The matrix is a suggested way to present a consolidated HVM (Do's - 6)

In fact, after the consolidation, the *P-HVM* will be very complex, which is too hard to read by other designers who didn't participate in the research stage but join in the design progress. Thus, integrate HVMs into the matrix (see Appendix C) and extract the part designers concern about to build a *P-HVM* in a small scale is the clearer way to present important information.

Step 5. Arranging the quantitative survey

There will be several routes to reach a single value or a consequence. The situation makes designers confused that which one is the more important way to attain users' values. Hence, we suggest delivering the questionnaire based on the routes of *P-HVM* to get the weights on it when designers need to make choices from these options (see Appendix D).

Give the rights for participants to skip the question (Do's - 7)

The questionnaire will be a little hard for some participants. Because the design of the questionnaire is based on the participants' output from interviews, but most of the participants who answering the questionnaire aren't in the same context with the formers. Thus, it's predictable that they will feel confused toward some questions, and we should serve them rights to skip it, and also prevent the invalid data.

Step 6. Conducting workshop or brainstorming

After building up the *P-HVM* designer can arrange the workshop or brainstorming to deliver the corresponding design factors that match the design specification that functional consequences offer.

5.4 How to use the *P-HVM* for design

According to the instruction of building a *P-HVM* in 5.3, designers now need to move to the next step, applying it. The study presents how a designer uses the HVM for designing in this section.

When designers set the target users they are designing for, and establish the user studies to realize them and their personal values, but still can't figure out what kinds of design strategies can be referenced. In that way, designers can apply the *P-HVM* to help design according their demands.

The following is a persona based on the type of target users of wellness services in the other project, *The Innovative Design of Wellness Services*, we've worked on. We want to deliver the wellness service design that meets the values from our target users.

5.4.1 Setting the research subjects

	**LIFE STYLE** Hi, I'm Jessica, an office worker. I'm an Iphone user. I use my phone to take pictures, play games and browse friends' update on Facebook. I really care about my figure that I want to keep slim and healthy, but, I enjoy delicious fare, and I don't have regular exercise habits. I had joined the gym, and bought a lot of fitness instruction DVD, but I always feel lazy to take exercise and make excuse to quit.
Jessica Cheng age 27	**NEED** I need a strong motivation to conquer laziness and give rise to the interest of taking exercise.

Table 5-2 persona of target users

Since Jessica doesn't involve in physical activities very much, her most important value is pursuing a strong motivation to do exercises. According to the values in the wellness we've worked on, we suggest to apply the P-HVM of "Strong motivation" (see Fig 5-6).

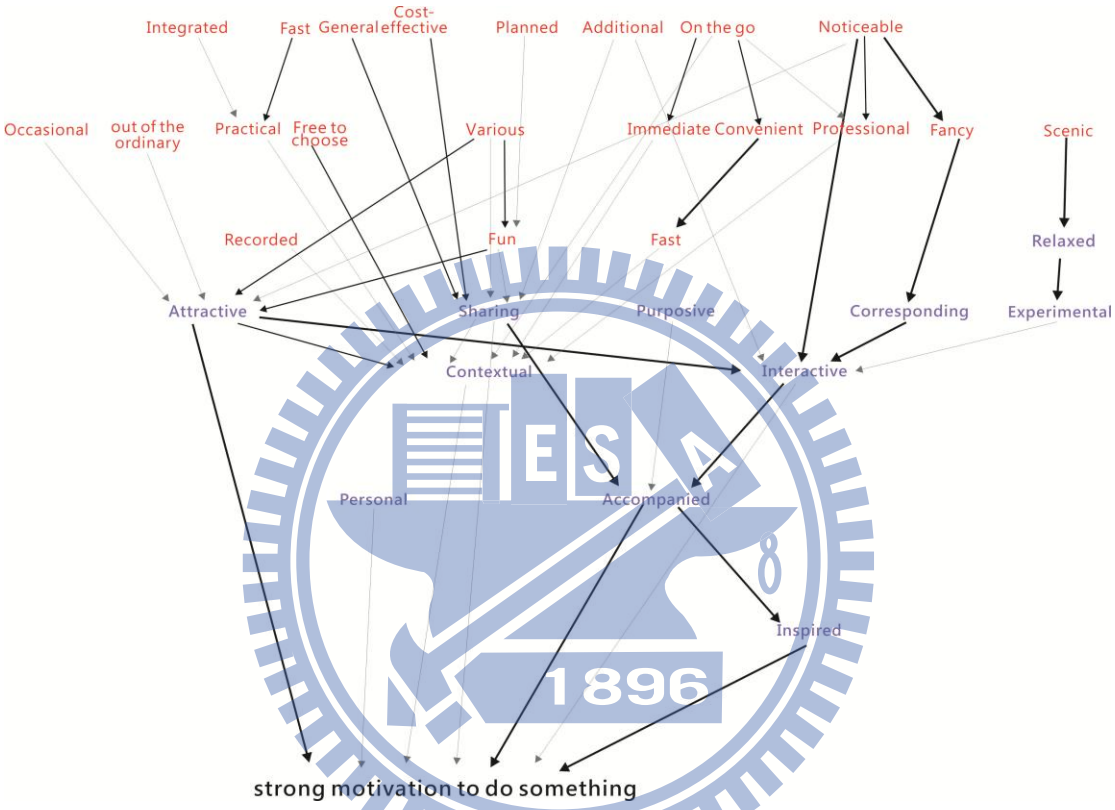


Fig 5-6 the P-HVM of value "Strong motivation to do something"

According to the *P-HVM*, it tells that the emotional consequences "Attractive", "Accompanied" and "inspired" are the direct influential feelings to attain motivation. The functional consequences "Various" and "Fun" are important to get the feeling "Attractive" and "Interactive", in addition the feeling "Interactive" is related with "Noticeable", "Fancy" and "Corresponding" too; the feeling "Sharing" is affected by "Cost-effective" and "General", both of them point to the feeling "Accompanied" and also further to "Inspired".

Since we have the information of the relationship between Jessica's personal value and the relative feelings, now we can try to map the corresponding attributes as design factors. Here, the study used the design factors for wellness technologies suggested by Ahtinen et al. (2008) to map with the *P-HVM*, shown in Table 5-5.

Consequences related to motivation	Ahtinen et al. design factors (2008)
Fast	Prompts and Alarms
On the go	Prompts and Alarms
Fun	Wellness games
Interactive	Comparison, Peer pressure, Social support
Accompanied	Comparison, Peer pressure, Social support
Sharing	Comparison, Peer pressure, Social support
Inspired	Comparison, Peer pressure, Social support

Table 5-3 the corresponding design factors

"Fast" and "On the go" apply the design factors "Prompts" and "Alarms". The consequence "Fun" can be transfer to "Wellness games". Moreover, the consequences "Interactive"," Accompanied"," Sharing" and "Inspired" can be flavored with "Comparison", "Peer pressure" and "Social support".

Through these design factors, designers can provide a wellness service that resembles wellness game, which can compete with friends. In addition, prompt the reminder based on users' exercise habits to remind physical activities can be a way to encourage people who are like Jessica to get involved in healthy living style, and increase their motivation to taking exercise.

5.5 Summary

In this chapter, the study brings up the discussion about the values in the wellness; we conclude them into four groups, which also support the claims in the preceding chapters. Apart from this, the guideline about conducting the whole

process includes HVM crossing and the proposed HVM, *P-HVM*, are delivered to help designs in the related fields. Finally, the study uses a design problem as the example to direct the application of *P-HVM.*

Chapter 6

Conclusion

Through the process of conducting interviews, integrating consequences and values from participants, the study deliver the *P-HVM* with crossed structure, which not only contributes to attain users' value in the wellness, it can also be extended to other domain of application design. At the end of thesis, this study concludes with findings, limitations and future works.

6.1 Conclusion and Contribution

As stated in chapter 1, the primary goal of this research is to get users' values and the corresponding design factors through a systematic process. The results are delivered match with three objectives previously.

A. The four types of 17 values in the wellness are noted

Through the interviews and affinity diagram, we found the four types of values, "The gradual progress in the wellness", "The efficiency in the wellness", "The motivation can lead to better performance in the wellness" and "The quality in the wellness", include 17 personal values that affect users when they are coping with physical activities. They need motivation to involve in the field, and pursue progress and efficiency in the period; also, the participants who are economic independent pursue quality of related facilities. The values are given from multi-faceted aspects, which comprehend different sides of wellness.

Designers can apply these findings into design to meet general users' attitudes

and needs in the wellness, such as wellness APPs and activities. In addition, the researcher in the field of wellness promotion, the fitness coaches and PE teachers can also employ the result to take corresponding strategies to encourage people involve in physical activities or planning for further research.

B. The related feelings suggested as design factors in the wellness are carried out

By adopting the crossed structure of combining the parts of HVMs from different subjects, the types of functional consequences, “The first impression on the service”, “The personal feelings about choices the services offer”, “The personal feelings about functions the services offer”, “The personal feelings about efficiency”, “The personal feelings about occasions” and “The relations with exercises”, as well as the types of emotional consequences, “The personal feelings about sociability”, “The personal feelings about merit”, “The personal feelings about efforts”, “The personal feelings toward the service” and “The personal feelings about involvement” are proposed as design opportunities to carry out the wellness applications that meet users’ values.

Moreover, researchers and designers in any field can also apply the relations between these two kinds of consequences as reference for designs or researches. If they want to provide a design with themes related to our emotional consequences, they can reference the linked functional consequences as design factors. On the contrary, if they want to figure out the product with certain function can lead to what kind of emotions, they can route to the emotional consequences begin with functional consequences.

C. A comprehensive approach for value-based design is proposed

The whole process that delivers the target values by laddering and transforms the design factors from existing welcomed products into new design opportunities is not limited in the field of wellness applications. Designers can adopt it to different topics of design, especially in a new field that hasn't build up users' values and diversified design elements yet.

By referencing the methodology and guidelines in Chapter 5, designers can select a best way to deal with the values according to the users and assure the outcomes may be targeted.

6.2 Research Limitations

In this research, we found there are several limitations of building a *Crossing HVM*. On the stage of Affinity diagram, for the reason that consequences are really subjective, there will be so many different rules on grouping and sorting depend on deferent thinking logic, thus we haven't delivered standardization, and there will be some deviation of the utilization between different designers.

Also, on the stage of quantitative survey, there are so many linkages between all elements, although we just pick the ones in the situation of multiple linkages point to a single node as the questions, but we still received a lot of complaints from the participants. If there are too many questions need to be answered, participants may be impatient, and even provide invalid answers that may affect the credibility of the weights.

6.3 Outlook & Future Direction

According to the attention addressed on Human Computer Interaction, delivering a good using experience is the primary goal of interface design. Designers need to put emphasis on personal motivation, attitudes and values that have influence in the user experience among other factors. Thus, it is worth exploring how to get comprehensive information from users. The following are some future direction of the studies regarding the *Crossing HVM* we provided here:

A. A deeper research can be conducted to standardize the type of consequences, such as the concrete definition and scope of functional and emotional consequences, which can prevent the confusion that may happen in the cooperated design project.

B. The cases that designers prepared can be altered to working prototypes or presented by videos. Because using the cases cards to illustrate a product or service that participants never experienced before needs imagination. Providing prototypes or videos can help participants involve in the real context much better.

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http://www.livestrong.com/thedailyplate/iphone-calorie-tracker/

Dr.eye iWalk
http://www.dreye-health.com/SingularController?service=goPedoPro

DOH(Department Of Health R.O.C) 98 年國人主要死因統計

http://www.doh.gov.tw/CHT2006/DM/DM2_p01.aspx?class_no=25&level_no=1&doc_no=76013

Healthy Store
http://iapp.com.tw/app.php?id=386917791

Institute For Information Industry 2009 年第四季我國行動上網觀測

http://www.find.org.tw/find/home.aspx?page=many&id=252

Kinect
http://www.xbox.com/zh-TW/kinect

Micoach
http://www.adidas.com/tw/micoach/#

National Wellness Institute
http://www.nationalwellness.org/index.php?id_tier=89&id_c=148

Nike +
http://nikerunning.nike.com/nikeos/p/nikeplus/zh_TW/

Runkeeper
http://runkeeper.com/running-app

5K Coach Plans
http://itunes.apple.com/us/app/5k-coach/id381331209?mt=8

Appendix A

Screening inquiries

本研究為國立交通大學應用藝術研究所論文計畫，目的是為了進行智慧手機之運動健康應用程式之研究調查，內容為瞭解受訪者針對運動健康相關活動之需求與態度

我們將會請您接受訪談。您的訪談內容只會作為學術研究分析之目的使用。除非得到您的書面同意，我們不會以其他名義或目的使用您的訪談錄音、影像以及所記錄的文本。為感謝您同意接受我們的訪談，並配合我們執行這項計畫，我們將致贈新台幣 1500 元作為受訪報酬。

受訪者個人資料

姓名:_____ 年齡:_____

職業:_____

運動習慣: 每週_____次

運動類型:_____

使用手機型號:_____

是否有使用運動或健康相關手機應用程式:□否 □是，其為_____

Appendix B

訪談案例

北市內湖運動中心

提供市民運動休閒服務的多功能大樓，包含游泳池、各種類球館、攀岩場、體適能健身房、多功能靜態教室等。

服務特質

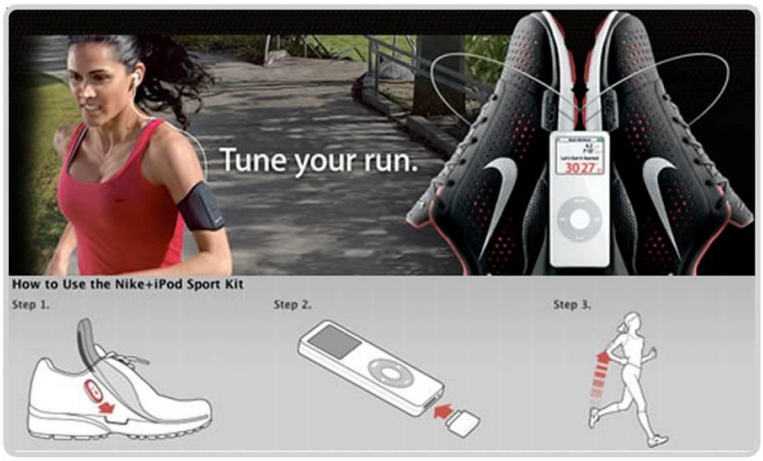
多功能綜合球館
一對一專屬教練
全國最大攀岩場
量身訂做運動課程
有汽機車停車場
銀髮敬老卡可免費入場
運動課程諮詢
教室場館租借
完善的健身器材

世界健身俱樂部

講求環境品質的健身中心，提供專業與多樣性的健身器材、豐富課程及教練諮詢。

服務特質

年費約新台幣20000-30000元
免費團體課程
專業、多樣化健身器材
SPA、烤箱、梳洗設備
付費專業一對一教練(量身打造課程)
新潮、前衛的裝潢環境
托兒服務
兒童遊樂區域
果汁吧社教區



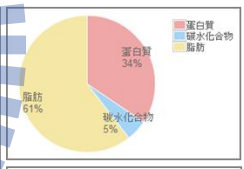
Nike +(Nike Plus)

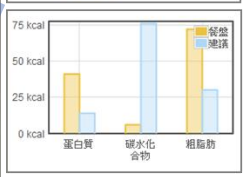
透過一系列Nike+的感應器來記錄運動狀況，並透過線上社群和世界各地的運動朋友們分享成果或比賽。

服務特質

追蹤跑步記錄
和朋友比賽交流
設定訓練目標
分享自訂分身MINI
同步社群網站

與明星共跑
掌握朋友的運動狀況
接收運動新知
由地圖和社群決定你的跑步路線
隨時檢視過去的運動回憶
建立你的運動朋友圈





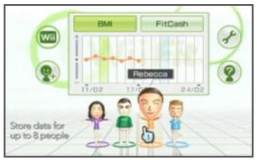
Smile Diet

飲食紀錄的社群網站，使用者可以透過共同建立的食物資料庫幫助紀錄、計算卡路里，達到健康飲食、減重的目的。

服務特質

免費服務
食物營養&卡路里資料庫
設定目標
熱量控制與攝取計算
BMI計算

減肥、心情日記
尋找同伴
營養圖表
營養攝取叮嚀建議
減肥行事曆規畫

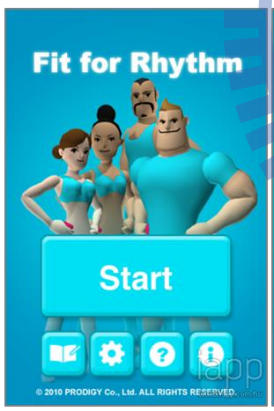


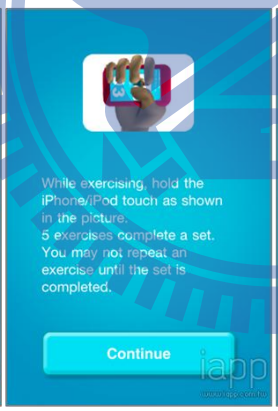
Wii Fit Plus

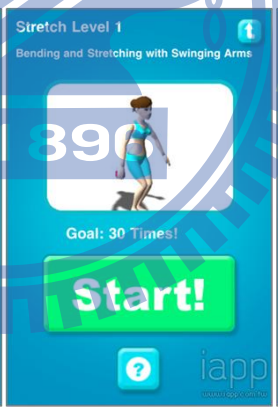
Wii Fit主打瑜珈、平衡、有氧運動、健身等，幫助遊戲者在家與家人共同運動遊戲，並可以管理自己的身體狀況。

服務特質

價格約新台幣10,000元
含有主機、遙控器、平衡器、軟體
結合運動之電視遊樂器，客廳使用
可量測身體重心平衡
量測BMI值
量測運動能力
量測Fit年齡
規劃減重之運動計劃
圖表顯示運動記錄及身體狀況
記錄消耗卡路里
可觀看個人及家人記錄
四種運動遊戲類型
依需求的特配課程訓練







Fit 4 Rhythm

下載至smart phone上的APP，經由虛擬教練簡易教學影片，再藉由手機感測動作，計算使用者的正確動作達成任務破關。

服務特質

免費使用4個項目各一個等級，共20個小動作
完整版2.99美金，可享受80個小運動
4種運動類型(伸展、有氧、平衡、肌肉)
動畫教學
手機偵測動作
鼓勵計次音效
顯示卡路里消耗
獎勵回饋
設定個人身體狀態
發布任務進度至社群網站
運動行事曆
檢測目標完成

新起點健康生活

透過一系列的健康課程、營養烹飪、養生活動、團體旅行、健康飲食等，在營隊期間獲得健康觀念，並培養出健康生活。

服務特質

有短中長程班可供挑選
地點位於南投，環境清幽
三育健康中心與臺安醫院合作
需在健康中心居住
價格依日期長短、房間、會員不同而有差異

課程戶內戶外兼具
健康講座
營養課程
心靈舒壓課
健康烹飪課程

天然療法學習
運動健走時間
戶外郊遊
健康協談
體檢

台北市民健康卡

鼓勵臺北市民定期接受預防注射、疾病篩檢、參加健康促進活動等集點活動，可藉由該卡提供的點數獲得健康服務。

服務特質

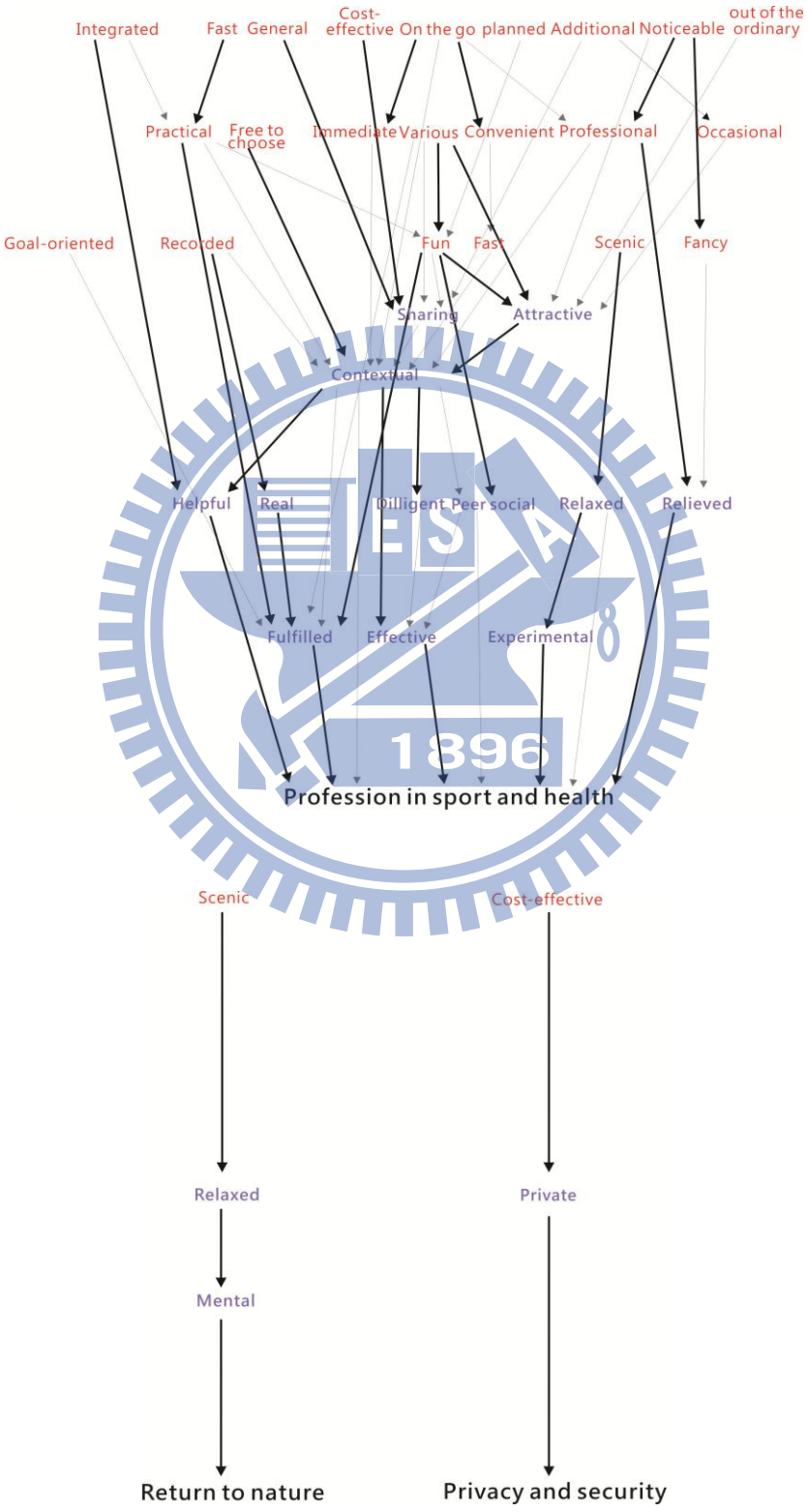
辦卡免費，但部分活動需要花錢
鼓勵參與國人常見疾病篩檢
鼓勵注射衛生署公告之預防疫苗
健康服務中心或醫院志工
健康講座或健康促進活動

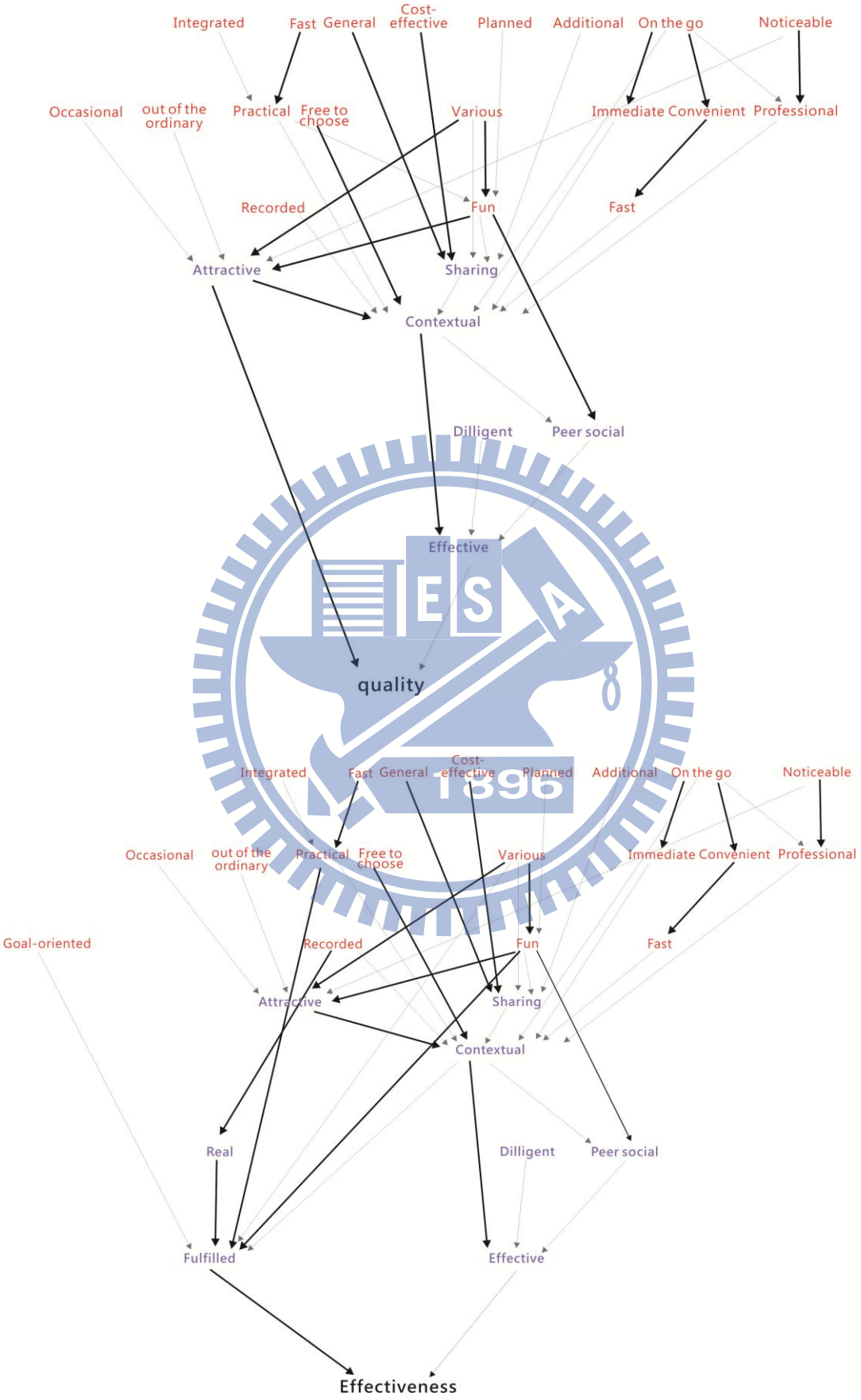
網路電話預約掛號
婚前婚後健康檢查
戒菸班
成功健康減重
台北市民健走活動

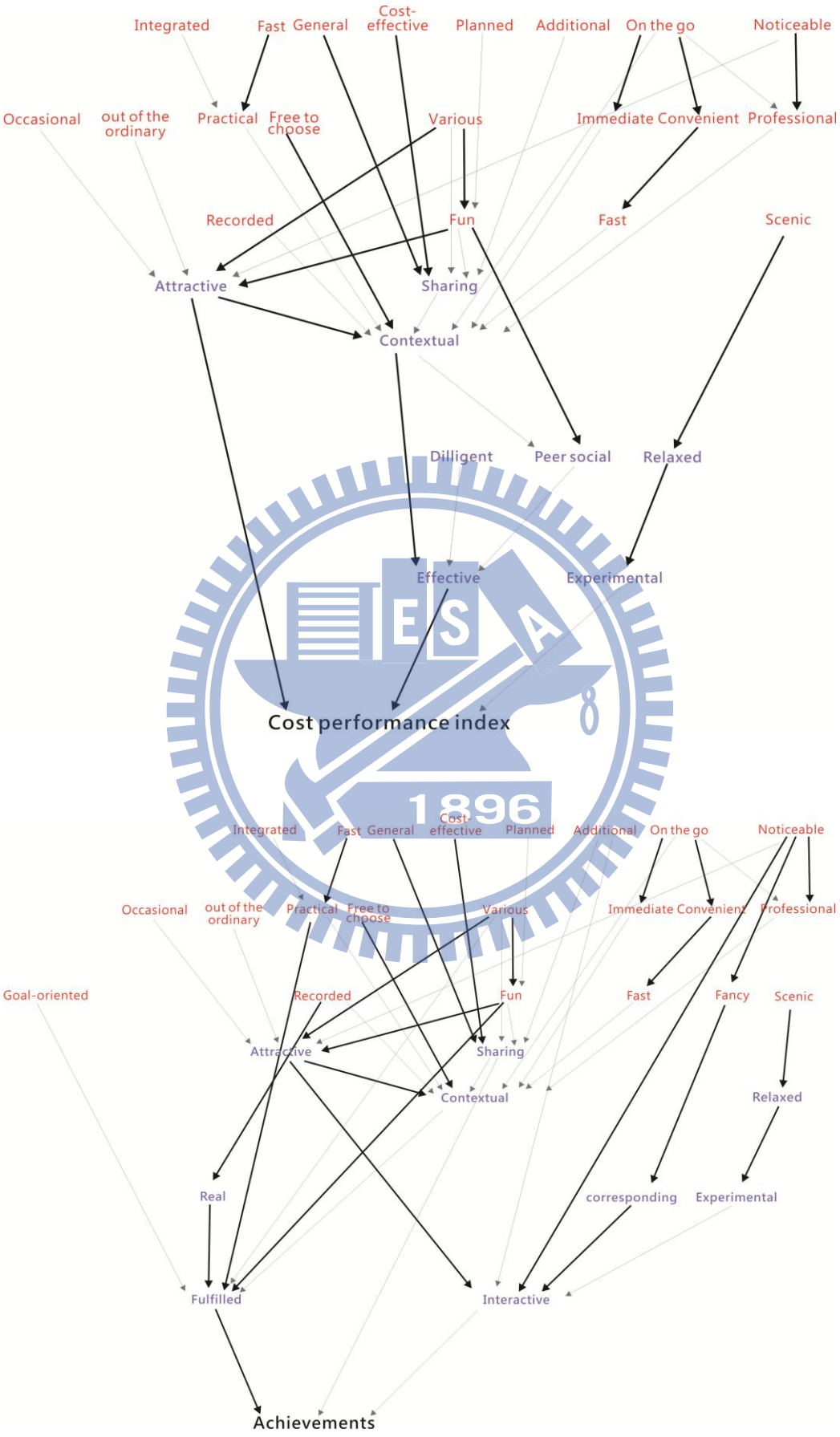
鼓勵辦理器官捐贈卡
回饋：免門診掛號費
回饋：部門休閒育樂場所折價券
回饋：免費健康檢查

Appendix C

17 Values in the wellness




Integrated
Fast
General
Cost-effective
Planned
Additional
On the go
Noticeable
Occasional
out of the ordinary
Practical
Free to choose
Various
Immediate
Convenient
Professional
Recorded
Fun
Fast
Attractive
Sharing
Contextual
Dilligent
Peer social
Effective
quality
Goal-oriented
Real
Fulfilled
Effectiveness


Integrated
Fast
General
Cost-effective
Planned
Additional
On the go
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Practical
Free to choose
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Professional
Recorded
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Dilligent
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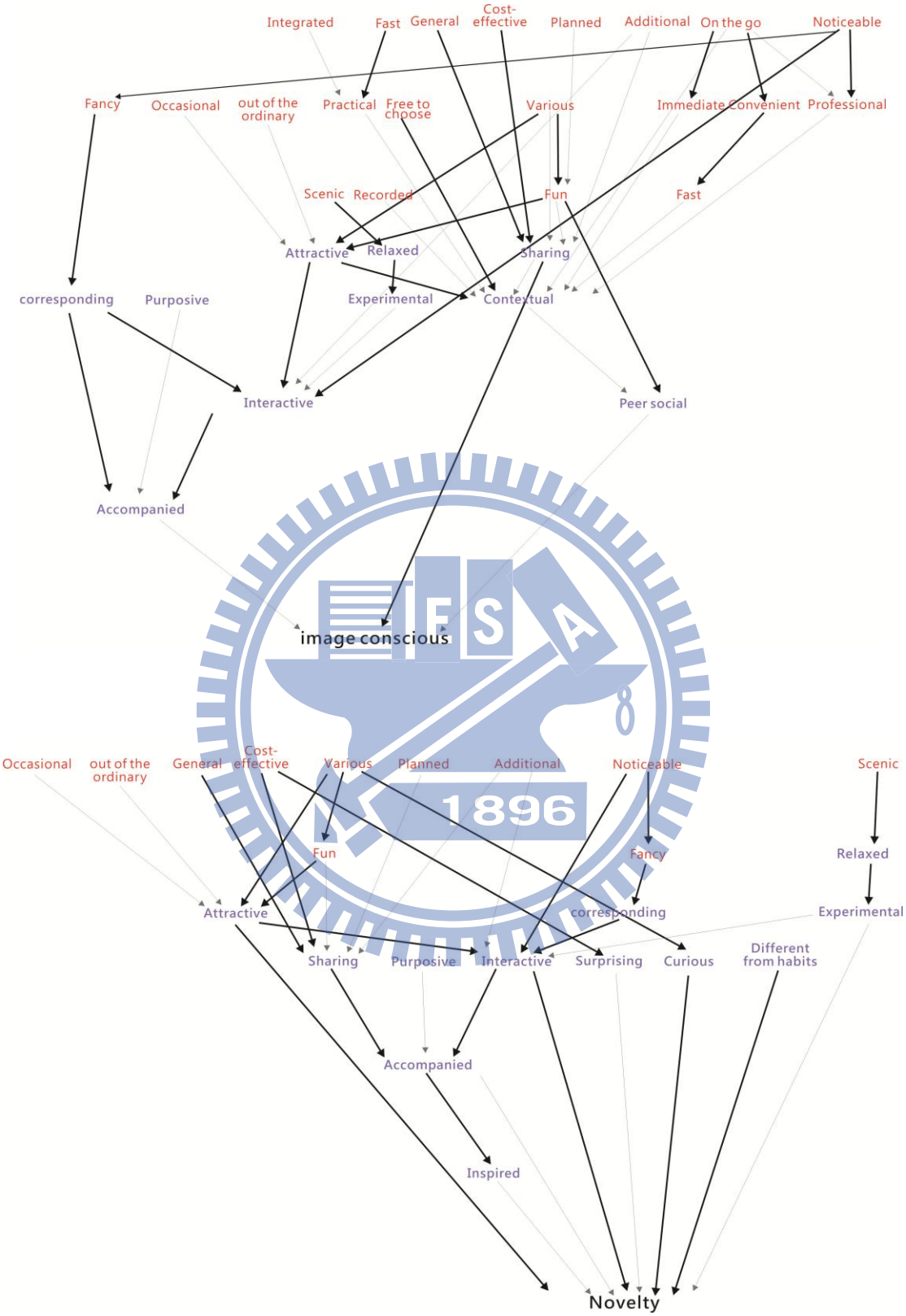
Experimental
Fulfilled
Interactive
Achievements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Accompanied
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Occasional
out of the ordinary
General
Cost-effective
Various
Planned
Additional
Noticeable
Scenic
Fun
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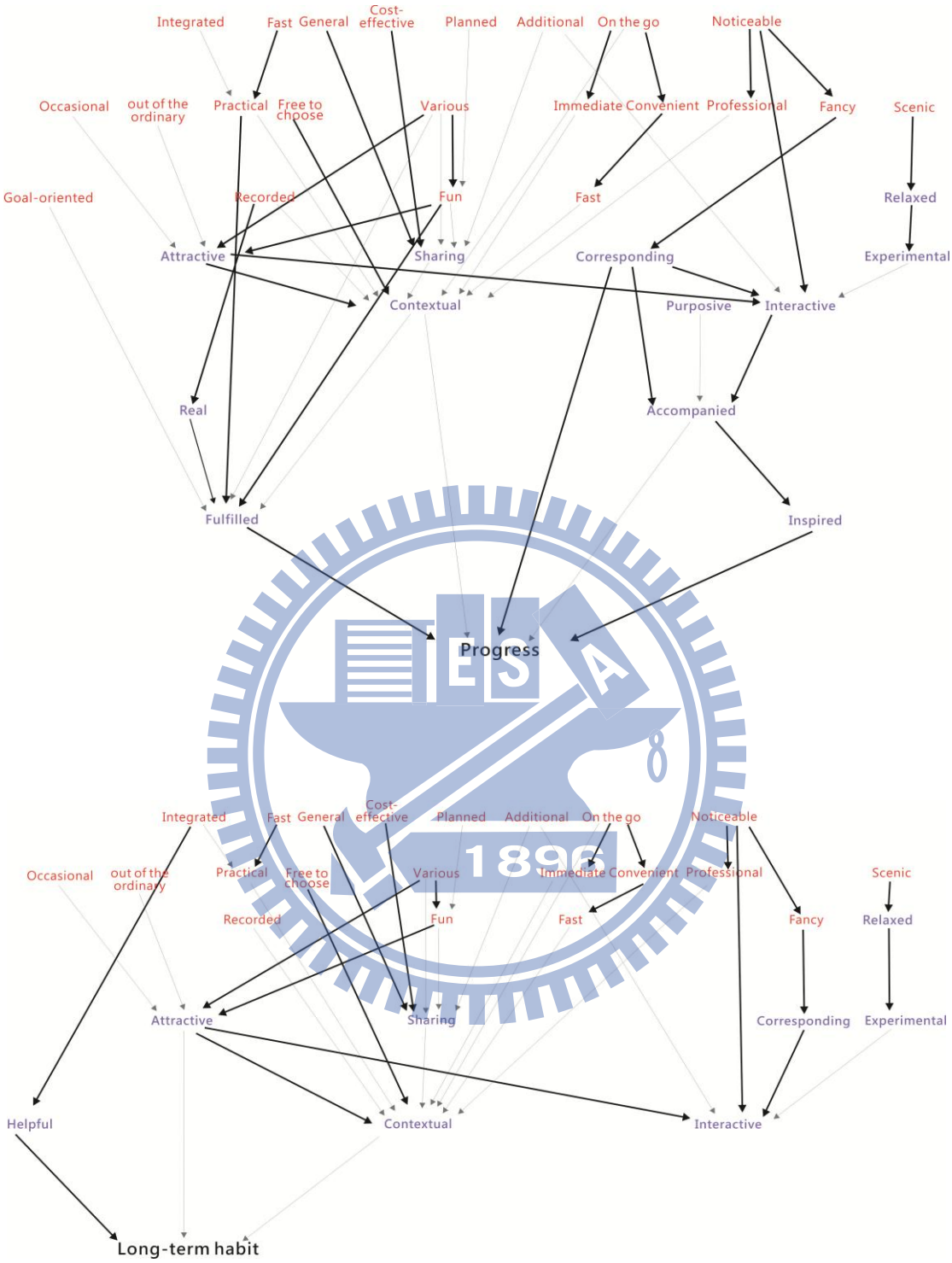
Relaxed
Attractive
corresponding
Experimental
Sharing
Purposive
Interactive
Surprising
Curious
Different from habits
Accompanied
Inspired
Novelty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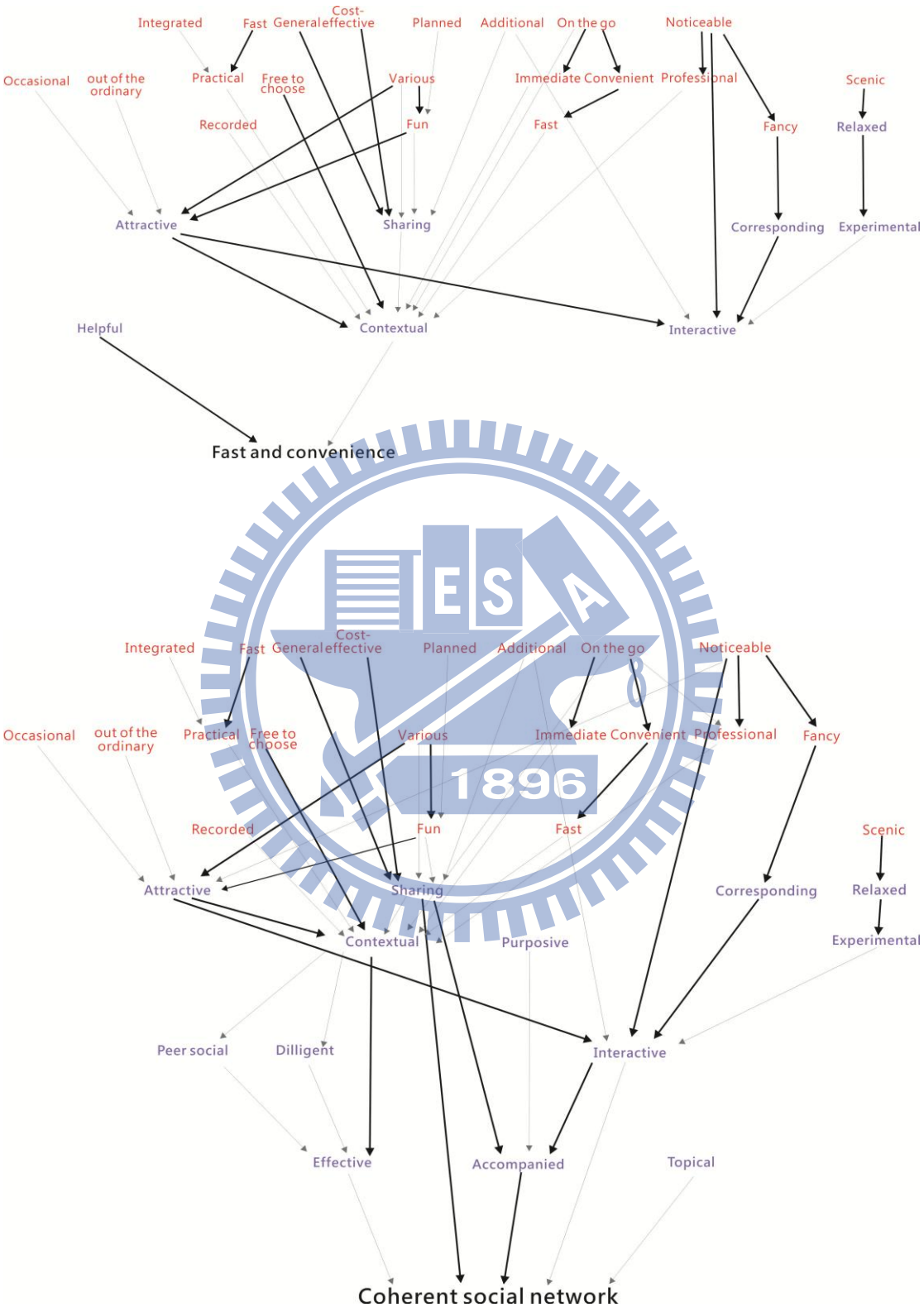
Professional
Fancy
Scenic
Goal-oriented
Recorded
Fun
Fast
Relaxed
Attractive
Sharing
Corresponding
Experimental
Contextual
Purposive
Interactive
Real
Accompanied
Fulfilled
Inspired
Progress
Integrated
Fast
General
Cost-effective
Planned
Additional
On the go
Noticeable
Occasional
out of the ordinary
Practical
Free to choose
Various
Immediate
Convenient
Professional
Scenic
Recorded
Fun
Fast
Fancy
Relaxed
Attractive
Sharing
Corresponding
Experimental
Helpful
Contextual
Interactive
Long-term habit


Integrated
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General
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Scenic
Recorded
Fun
Fast
Fancy
Relaxed
Attractive
Sharing
Corresponding
Experimental
Contextual
Interactive
Helpful
Fast and convenience
Integrated
Fast
General
Cost-effective
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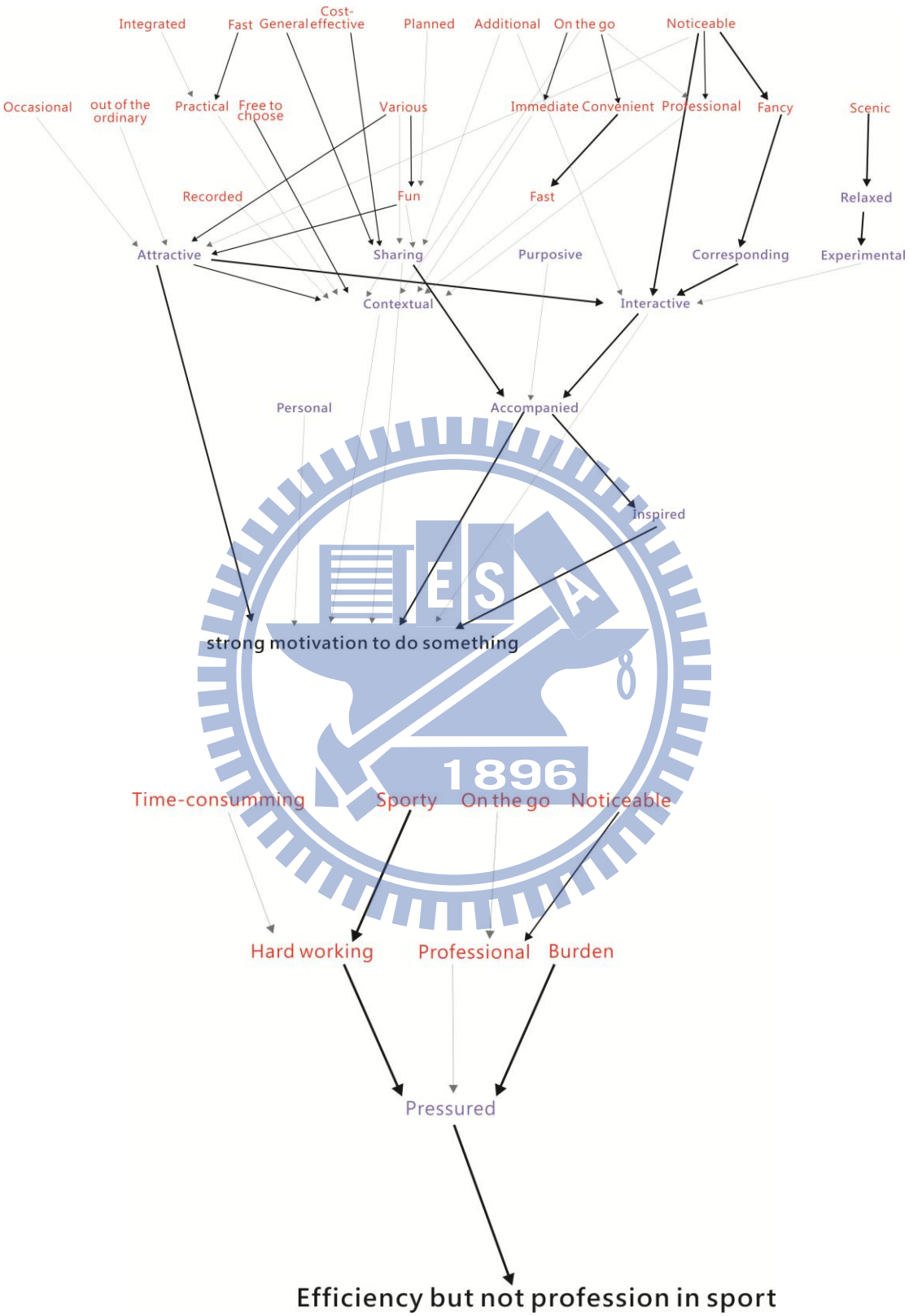
Additional
On the go
Noticeable
Occasional
out of the ordinary
Practical
Free to choose
Various
Immediate
Convenient
Professional
Fancy
Recorded
Fun
Fast
Scenic
Attractive
Sharing
Corresponding
Relaxed
Contextual
Purposive
Experimental
Peer social
Dilligent
Interactive
Effective
Accompanied
Topical
Coherent social network


Integrated
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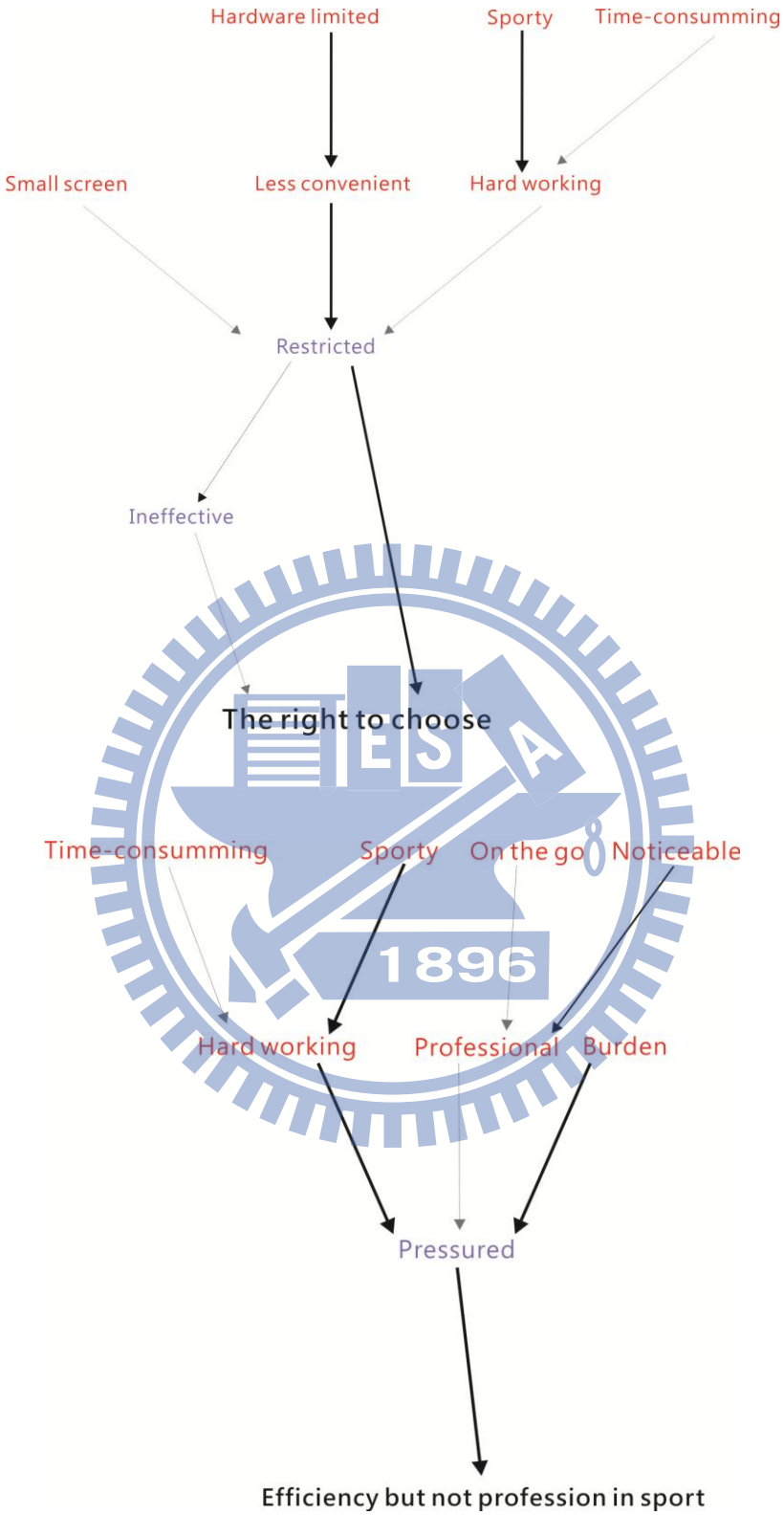
Convenient
Professional
Fancy
Scenic
Recorded
Fun
Fast
Relaxed
Attractive
Sharing
Purposive
Corresponding
Experimental
Contextual
Interactive
Personal
Accompanied
Inspired
strong motivation to do something
Time-consumming
Sporty
On the go
Noticeable
Hard working
Professional
Burden
Pressured
Efficiency but not profession in sport


Hardware limited
Sporty
Time-consumming
Small screen
Less convenient
Hard working
Restricted
Ineffective
The right to choose
Time-consumming
Sporty
On the go
Noticeable
Hard working
Professional
Burden
Pressured
Efficiency but not profession in sport

Appendix D

權重問卷

使用者之於運動與健康服務態度問卷調查

您好，這是一份學術論文的問卷，問卷的內容主要探討使用者對於運動健康相關服務的態度，
以做為日後手機相關應用程式開發設計之依據。

感激您的參與，問卷中，每一題皆為一態度敘述的句子，請依照個人感受，勾選是否同意。
1至5分，依序為非常不同意至非常同意。
若覺得無法判定該選哪個答案時，可以空白不選。
填寫過程無時間限制，隨時可回頭更改答案，填寫完畢後，請按"submit"提交。

您所填答的內容僅作為本研究整體分析之用，不會做個別發表，並確實保障您的隱私權，
敬請安心作答。感謝您的支持與協助，您的填答必將使本研究更具代表性與參考價值。

* Required

個人基本資料

性別 *
- [ ] 男性
- [x] 女性

年齡 *
- [ ] 20-24
- [x] 25-29
- [ ] 30-34
- [ ] 35-39

運動頻率 *
- [ ] 無固定運動習慣
- [x] 每週1次
- [ ] 每週2-3次

若認為該題無法判定，可留空白不需勾選

1.我覺得專業的運動與健康服務，是讓人感到放鬆的
(Profession)

	1	2	3	4	5	
非常不同意	○	○	○	○	○	非常同意

2.我覺得專業的運動與健康服務，是讓人感到安心的
(Profession)

	1	2	3	4	5	
非常不同意	○	○	○	○	○	非常同意

3.我覺得專業的運動與健康服務，對我是有幫助的
(Profession)

	1	2	3	4	5	
非常不同意	○	○	○	○	○	非常同意

4.獲得專業的運動與健康服務，會讓我感到滿足的
(Profession)

	1	2	3	4	5	
非常不同意	○	○	○	○	○	非常同意

5.我認為可以體驗看看的服務，可以幫助我追求運動與健康上的專業度
(Profession)

	1	2	3	4	5	
非常不同意	○	○	○	○	○	非常同意

6.我認為在生活脈絡中的服務，可以幫助我追求運動與健康上的專業度
(Profession)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

7.我認為可以看見效果如何的運動與健康服務，是較專業的
(Profession)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

8.我認為具同儕社群的運動與健康服務，是較專業的
(Profession)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

9.我認為有品質的運動健康服務，是有吸引力的
(Quality)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

10.我認為有品質的運動健康服務，是可以看見效果的
(Quality)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

11.我認為有效果的運動健康服務，會讓我感到安心的
(Effectiveness)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

12.我認為看得到效果的運動健康服務，才是有效的
(Effectiveness)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

13.對我有吸引力的運動健康服務，性價比(cp值)是較高的
(CPI)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

14.可看見效果的運動健康服務，性價比(cp值)是較高的
(CPI)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

15.可體驗看看的運動健康服務，性價比(cp值)是較高的
(CPI)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

16.高互動性的運動健康服務，較能獲得成就感
(Achievements)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

17.可和人一同分享的運動健康服務，較能獲得成就感
(Achievements)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

18.如果滿意自己的運動與健康生活，即是一種成就感的獲得
(Achievements)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

19.我認為可以透過與人分享，來幫助我建立自我形象
(Image)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

20.我認為參與運動健康服務，可以在同儕社群中建立自我形象
(Image)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

21.我認為有同伴陪伴的運動健康服務，可以幫助建立自我形象
(Image)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

22.我認為有同伴的運動健康服務，會讓我感到新奇
(Novelty)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

23.我認為在參與運動健康服務中受到鼓舞與激勵，是新奇的
(Novelty)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

24.我認為新奇的運動健康服務，對我是有吸引力的
(Novelty)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

25.我認為有互動的運動健康服務，會讓我感到新奇
(Novelty)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

26.我認為與以往習慣不同的運動健康服務，會讓我感到新奇
(Novelty)

1 2 3 4 5

非常不同意 非常同意

27.我認為可以體驗看看的運動健康服務，會讓我感到新奇
(Novelty)

1 2 3 4 5

非常不同意 非常同意

28.我認為可以勾起好奇心的運動健康服務，可以滿足我追求新奇的渴望
(Novelty)

1 2 3 4 5

非常不同意 非常同意

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29.我認為有驚喜的運動健康服務，可以滿足我追求新奇的渴望
(Novelty)

1 2 3 4 5

非常不同意 非常同意

30.我認為融入在生活脈絡中的服務，會幫助我在運動健康中追求進步
(Progress)

1 2 3 4 5

非常不同意 非常同意

31.我認為具有同伴的服務，會幫助我在運動健康中追求進步
(Progress)

1 2 3 4 5

非常不同意 非常同意

32.我認為能夠對應到自身狀況的服務設計，會幫助我在運動健康中追求進步
(Progress)

1 2 3 4 5

非常不同意 非常同意

33.我認為能受到激勵鼓舞的服務，會幫助我在運動健康中追求進步
(Progress)

1 2 3 4 5

非常不同意 非常同意

34.當我在運動健康活動中獲得進步，我會感到滿足的
(Progress)

1 2 3 4 5

非常不同意 非常同意

35.具有同伴陪伴的服務，能讓我有更大的動力去追求運動與健康
(Motivation)

1 2 3 4 5

非常不同意 非常同意

36.較個人專屬的服務，能讓我有更大的動力去追求運動與健康
(Motivation)

1 2 3 4 5

非常不同意 非常同意

37.能受到鼓舞與激勵的服務，會讓我有更大的動力去追求運動與健康
(Motivation)

1 2 3 4 5

非常不同意 非常同意

38.面對對我有吸引力的服務，我會因此有較大的動力去追求運動與健
(Motivation)

1 2 3 4 5

非常不同意 非常同意

39.可與人分享的服務，能讓我有更大的動力去追求運動與健康
(Motivation)

1 2 3 4 5

非常不同意 非常同意

40.在生活脈絡中的服務，能讓我有更大的動力去追求運動與健康
(Motivation)

1 2 3 4 5

非常不同意 非常同意

41.較有互動的服務，能讓我有更大的動力去追求運動與健康
(Motivation)

1 2 3 4 5

非常不同意 非常同意

42.對我有吸引力的服務，能讓我養成運動與健康的長期習慣
(Long-term habit)

1 2 3 4 5

非常不同意 非常同意

43.在生活脈絡中的服務，能讓我養成運動與健康的長期習慣
(Long-term habit)

1 2 3 4 5

非常不同意 非常同意

44.若在運動保健相關活動中，提供的服務對我是有幫助的，將有助於長期習慣養成
(Long-term habit)

1 2 3 4 5

非常不同意 非常同意

45.在生活脈絡中的運動保健服務，對我而言是快速又方便的
(Fast&convenience)

1 2 3 4 5

非常不同意 非常同意

46.快速又方便的運動保健服務，對我是有幫助的
(Fast&convenience)

1 2 3 4 5

非常不同意 非常同意

47.可與人分享的運動保健服務，能夠幫助我追求更完善的社交生活
(Social network)

1 2 3 4 5

非常不同意 非常同意

48.有互動的運動保健服務，能夠幫助我追求更完善的社交生活
(Social network)

1 2 3 4 5

非常不同意 非常同意

49.可以互相陪伴的運動保健服務，能夠幫助我追求更完善的社交生活
(Social network)

1 2 3 4 5

非常不同意 非常同意

50.具話題性的運動保健服務，能夠幫助我追求更完善的社交生活
(Social network)

1 2 3 4 5

非常不同意 非常同意

51.參與有效果的運動保健服務，能夠讓我在社交生活中受到矚目
(Social network)

1 2 3 4 5

非常不同意 非常同意

52.可與人分享的運動健康服務，能讓我覺得是被陪伴的
(Accompanied)

1 2 3 4 5

非常不同意 非常同意

53.對我而言，享受被陪伴的感覺，也是參與運動健康的一種目的
(Accompanied)

1 2 3 4 5

非常不同意 非常同意

54.有互動的運動健康服務，能讓我覺得是被陪伴的
(Accompanied)

1 2 3 4 5

非常不同意 非常同意

55.可與人分享的運動健康服務，是融入在我生活脈絡中的
(Contextual)

1 2 3 4 5

非常不同意 非常同意

56.融入在我生活脈絡中的運動健康服務，對我而言是有吸引力的
(Contextual)

1 2 3 4 5

非常不同意 非常同意

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57.在生活脈絡中的運動健康服務，我對它的滿意度會較高
(Fulfilled)

1 2 3 4 5

非常不同意 非常同意

58.能夠真實體驗的運動健康服務，我的滿意度較高
(Fulfilled)

1 2 3 4 5

非常不同意 非常同意

59.在生活脈絡中的運動健康服務，對我而言是較有效用的
(Effective)

1 2 3 4 5

非常不同意 非常同意

60.需努力執行的運動健康服務，對我而言是較有效用的
(Effective)

1 2 3 4 5

非常不同意 非常同意

61.具同儕社群的運動健康服務，對我而言是較有效用的
(Effective)

1 2 3 4 5

非常不同意 非常同意

62.有互動性的運動健康服務，對我而言是較有吸引力的
(Interactive)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

63.能對應到自身狀態的運動健康服務，能讓我感受到互動性
(Interactive)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

64.可體驗看看的運動健康服務，對我而言是較有互動的
(Interactive)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

65.我認為可自由選擇搭配的運動保健服務，是較能符合我的生活脈絡的
(Contextual)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

66.我認為較專業的運動保健服務，是較能符合我的生活脈絡的
(Contextual)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

67.我認為較快速的運動保健服務，是較能符合我的生活脈絡的
(Contextual)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

68.我認為較即時的運動保健服務，是較能符合我的生活脈絡的
(Contextual)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

69.我認為能夠記錄過程的運動保健服務，是較能符合我的生活脈絡的
(Contextual)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

70.我認為能夠隨身攜帶的運動保健服務，是較能符合我的生活脈絡的
(Contextual)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

71.我認為所謂較實用的運動保健服務，即為較能符合我的生活脈絡的
(Contextual)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

72.我認為偶爾體驗看看的運動保健服務，是有吸引力的
(Attractive)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

73.我認為能夠主動提醒的運動保健服務，是有吸引力的
(Attractive)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

74.我認為多樣化的運動保健服務，是有吸引力的
(Attractive)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

75.我認為與過往經驗不同的運動保健服務，是有吸引力的
(Attractive)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

76.我認為有趣的運動保健服務，是有吸引力的
(Attractive)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

77.我對於實用的運動保健服務，會感到滿意
(Fulfilled)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

78.我對於多樣化的運動保健服務，會感到滿意
(Fulfilled)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

79.我對於有趣的運動保健服務，會感到滿意
(Fulfilled)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

80.我認為以目標導向的運動保健服務，能夠讓我對自己感到滿意
(Fulfilled)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

81.我認為漂亮花俏的服務介面，能撫慰人心
(Relieved)

1 2 3 4 5

非常不同意 ○ ○ ○ ○ ○ 非常同意

82.我對於專業的運動保健服務，較能感到安心
(Relieved)

1 2 3 4 5

非常不同意 非常同意

83.我認為有同伴陪伴的運動保健服務，自己會付出較多努力是較划算的
(Accompanied)

1 2 3 4 5

非常不同意 非常同意

84.我認為有同伴陪伴的運動保健服務，運動的時間會過得較快速
(Accompanied)

1 2 3 4 5

非常不同意 非常同意

« Back Continue »

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85.有同伴陪伴的運動保健服務，對我而言是較實用的
(Accompanied)

1 2 3 4 5

非常不同意 非常同意

86.我認為在運動保健活動中有夥伴陪伴的功能，是很酷炫的
(Accompanied)

1 2 3 4 5

非常不同意 非常同意

87.我認為能夠客製化的服務，是較酷炫的
(Customized)

1 2 3 4 5

非常不同意 非常同意

88.我認為能夠客製化的服務，是較有趣的
(Customized)

1 2 3 4 5

非常不同意 非常同意

89.我認為能夠互相分享的服務，是種額外的功能
(Sharing)

1 2 3 4 5

非常不同意 非常同意

90.如果是划算的服務，會讓我想要與人分享
(Sharing)

1 2 3 4 5

非常不同意 非常同意

91.如果是很普及的服務，會讓我想要與人分享
(Sharing)

1 2 3 4 5

非常不同意 非常同意

92.我認為能夠互相分享的服務，是較多變化的
(Sharing)

1 2 3 4 5

非常不同意 非常同意

93.我認為能夠互相分享的服務，是較有趣的
(Sharing)

1 2 3 4 5

非常不同意 非常同意

94.我認為能夠主動提醒的運動保健服務，是較有互動的
(Interactive)

1 2 3 4 5

非常不同意 非常同意

95.我認為有許多附加功能的運動保健服務，是較有互動的
(Interactive)

1 2 3 4 5

非常不同意 非常同意

96.我認為整合多功能的運動保健服務，是實用的
(Practical)

1 2 3 4 5

非常不同意 非常同意

97.我認為可以快速執行的運動保健服務，是較實用的
(Practical)

1 2 3 4 5

非常不同意 非常同意

98.我認為有趣的運動保健服務，會較實用
(Fun)

1 2 3 4 5

非常不同意 非常同意

99.我認為有詳細規劃的運動保健服務，會較有趣
(Fun)

1 2 3 4 5

非常不同意 非常同意

100.我認多樣化的運動保健服務，會較有趣
(Fun)

1 2 3 4 5

非常不同意 非常同意

101.我認為主動提醒的運動保健服務，是專業的
(Profrssional)

1 2 3 4 5

非常不同意 非常同意

102.我認為隨時隨地都可執行的運動保健服務，是較專業的
(Profrssional)

1 2 3 4 5

非常不同意 非常同意

103.我認為較多年長者參與的運動保健服務，不符合我追求的形象
(Image)

1 2 3 4 5

非常不同意 非常同意

104.我認為有笨拙配備的運動保健服務，不符合我追求的形象
(Image)

1 2 3 4 5

非常不同意 非常同意

105.我認為較有壓力的運動保健服務，不符合我追求的形象
(Image)

1 2 3 4 5

非常不同意 非常同意

106.當一個運動保健服務在過程中易受到打斷時，會降低我參與的動力
(Motivation)

1 2 3 4 5

非常不同意 非常同意

107.當一個運動保健服務無法和我自身有所相對應時，會降低我參與的動力
(Motivation)

1 2 3 4 5

非常不同意 非常同意

108.當一個運動保健服務是有壓力的，會降低我參與的動力
(Motivation)

1 2 3 4 5

非常不同意 非常同意

109.當一個運動保健服務是易於偷懶的，會降低我參與的動力
(Motivation)

1 2 3 4 5

非常不同意 非常同意

110.在運動保健服務中，無法自由選擇所需時，會讓我覺得是沒有效果的
(Choose)

1 2 3 4 5

非常不同意 非常同意

111.在運動保健服務中，無法自由選擇所需時，會讓我覺得是被拘束限制的
(Choose)

1 2 3 4 5

非常不同意 非常同意

112.我認為過程容易被打斷的運動保健服務，會減低效率與方便性
(Fast&convenience)

1 2 3 4 5

非常不同意 非常同意

« Back Continue »

113.我認為不在脈絡之下的運動保健服務，會減低效率與方便性
(Fast&convenience)

1 2 3 4 5

非常不同意 非常同意

114.我認為有社交行為的服務，會減低運動中的效率與方便性
(Fast&convenience)

1 2 3 4 5

非常不同意 非常同意

115.我認為有所限制的運動保健服務，會減低效率與方便性
(Fast&convenience)

1 2 3 4 5

非常不同意 非常同意

116.我認為過多互動的運動保健服務，會減低運動中的專業性
(Profession)

1 2 3 4 5

非常不同意 非常同意

117.我認為過程容易被打斷的運動保健服務，會減低運動中的專業性
(Profession)

1 2 3 4 5

非常不同意 非常同意

118.我認為不夠專業的保健服務，是沒有吸引力的
(Profession)

1 2 3 4 5

非常不同意 非常同意

119.我認為不夠專業的保健服務，對我是沒有影響力的
(Profession)

1 2 3 4 5

非常不同意 非常同意

120.我認為不在脈絡之下的運動保健服務，會減低運動中的專業性
(Profession)

1 2 3 4 5

非常不同意 非常同意

121.如果一個運動保健服務會讓我感到麻煩惱人的，我會覺得這個服務的性價比(cp值)不高
(CPI)

1 2 3 4 5

非常不同意 非常同意

122.不吸引人的運動保健服務，對我而言其性價比(cp值)不高
(CPI)

1 2 3 4 5

非常不同意 非常同意

123.我認為沒有回應的運動保健服務，會讓我易於懶散
(Lazy)

1 2 3 4 5

非常不同意 非常同意

124.我認為容易達成的運動保健服務，會讓我易於懶散
(Lazy)

1 2 3 4 5

非常不同意 非常同意

125.當一個服務對我而言已經是很習慣的，我便會開始懶散
(Lazy)

1 2 3 4 5

非常不同意 非常同意

126.我認為需要辛苦鍛鍊的運動保健服務，會讓我感到有壓力的
(Pressured)

1 2 3 4 5

非常不同意 非常同意

127.我認為很專業的運動保健服務，會讓我感到有壓力的
(Pressured)

1 2 3 4 5

非常不同意 非常同意

128.我認為累贅的運動保健器材，在使用上會讓我感到有壓力的
(Pressured)

1 2 3 4 5

非常不同意 非常同意

129.我認為短期使用的服務，容易造成我的運動保健計畫是中斷的
(Interrupted)

1 2 3 4 5

非常不同意 非常同意

130.我認為有擁擠人潮的服務場地，容易造成我在運動過程中是被打斷的
(Interrupted)

1 2 3 4 5

非常不同意 非常同意

131.我認為較不方便取得的運動保健服務，會讓我感到被限制的
(Restricted)

1 2 3 4 5

非常不同意 非常同意

132.我認為需辛苦鍛鍊的運動保健服務，會讓我感到被限制的
(Restricted)

1 2 3 4 5

非常不同意 非常同意

133.小螢幕的運動保健裝置介面，會讓我感到被限制的
(Restricted)

1 2 3 4 5

非常不同意 非常同意

134.太困難的運動保健服務，會讓我感到很麻煩惱人的
(Annoying)

1 2 3 4 5

非常不同意 非常同意

135.需要花很多時間的運動保健服務，會讓我感到很麻煩惱人的
(Annoying)

1 2 3 4 5

非常不同意 非常同意

136.我認為運動形象強烈的服務，就是需要辛苦鍛鍊的
(Hard working)

1 2 3 4 5

非常不同意 非常同意

137.我認為需要花很多時間的服務，就是需要辛苦鍛鍊的
(Hard working)

1 2 3 4 5

非常不同意 非常同意

138.我認為在運動保健服務中，和運動本身無關的服務項目，是額外、多餘的
(Additional)

	1	2	3	4	5	
非常不同意	○	○	○	○	○	非常同意

139.我認為在運動保健服務中，如果沒有漂亮的設計或介面，便是額外、多餘的，無法引起共鳴
(Additional)

	1	2	3	4	5	
非常不同意	○	○	○	○	○	非常同意

作答結束!