

Disaster prevention package contents regularly maintenance design

Peng-Jyun, Liu *, Yi-Tzu, Lin **

**Institute of Applied Arts, National Chiao Tung University, 1001 University Road, Hsinchu, 300 Taiwan, ROC & Department of Creative Product Design, Asia University, 500, Lioufeng Rd., Wufeng, Taichung 41354, Taiwan, ROC, yu4038@asia.edu.tw, Corresponding Author*

*** No.1, University Rd, Puli, Nantou County, 54561 Taiwan (R.O.C.), yitzu0830@gmail.com*

Abstract: Disasters can keep life at the most important time frame for gold 72 hours. During this time, dependent on disaster prevention package self for help by oneself. The government promotion of disaster prevention knowledge. The papers deal of research, selected Taichung City and Nantou County as a survey area, the survey found that housing disaster package maintenance is difficult to manage and lead the people of Taiwan is not popular. Need for disaster prevention package users to enhance disaster prevention package holds rate maintenance management simple design.

Key words: *disaster prevention package, disaster reduction, Gold 72 hours, simple design, maintenance*

1. Introduction

Many disaster experience shows, which can keep human life in the event of a disaster the most important time limits for 72 hours. During this time, dependent on disaster prevention package self for help by oneself. Since September 21, 1999 Taiwan had happen 7.3 on the Richter scale earthquake, we called the 921 earthquake. In order to promote disaster prevention and the “Protection Act” was be intended, and then prevention efforts are gradually taking shape and have an opportunity. In recent years, such as the neighboring countries of Japan, Indonesia was experienced the earthquake and tsunami catastrophe, that cause casualties suffered heavy casualties. This vigilance for the disaster occurs to show consideration for the safety of life. From the national to the personal anti-disaster mitigation measures, compared with the imperative.

Attention to this point, in recent years Taiwan Government to strengthen the advocacy and promotion of the concept of disaster prevention, to enhance people growing popularity of the concept for peacetime disaster prevention and attention, but finding that disaster prevention package’s ownership rate. By the survey results found that because maintenance is not easy that caused not popular in Taiwan. For enhance disaster prevention package ownership rate, it must be carried out which easy to user maintenance management by design.

This research is a preliminary study; against in the emergency medical kits for disaster prevention packages that using management maintenance by design and then gradually developed to others. The expected characteristics of media and color management method, that disaster prevention package contents to save deadline visual color management. Making User to management and maintenance with convenient, and enhance the disaster prevention package’s penetration rate.

2. Literature review

2.1 About the disaster prevention package

Under the influence of global climate change, and increase in the incidence of extreme events caused by human destruction of natural, and it cause disasters produce [2]. Although the well-developed scientific and technological progress which not accurately predict the occurrence of natural disasters. The disaster prevention package disasters instant help which become everyone essential supplies. It has many names, for example, emergency relief, disaster prevention package, disaster prevention package, r package, etc. Disaster Prevention and Response Act, Article 10 stipulated that for disaster prevention and relief supplies that Including drinking water, food and other necessities, emergency medical equipment and medicines, essential for human life rescue apparatus and equipment, construction equipment, building materials and other emergency measures, as well as other necessary supplies and equipment, but it not set a proper name for the disaster prevention and relief supplies. In Taiwan the propaganda disaster prevention concepts, the most commonly used term for "emergency relief, disaster prevention package, referred to as the" disaster prevention package ". In this study, match the localization called Disaster Prevention package.

2.2 The Disaster Prevention packets use maintenance management

Currently, the disaster prevention and the package maintenance are with the local government disaster preventions and Rescue advocacy and drills. The people were less maintenance and disaster prevention package is no standard specified time. Deep plowing the implementation of the five-year medium-range plan "period away five years to promote its work, such as the National Fire Agency," Disaster Prevention and Response. The Ministry of the Interior to promote the work of Disaster Prevention and Response roots in the five-year medium-range plan, the five-year implementation timetable, the points ladder to assist the country's 22 city and county governments to strengthen the operational capacity of the Disaster Prevention and Rescue. Other, the disaster Prevention and Rescue Law Enforcement Rules for Disaster Prevention and Protection of information, communication and other equipment, equipment express worthy use of state should keep, and monthly implementation of functional testing at least once every six months at least held drill 1. Disaster Prevention package has been provided by the Government consider the problem of maintenance inconvenience that on admission strap marked each period of use of the supplies(Figure 1). But still generate omissions or update and then fill the problem occurred.



Figure 1 the disaster prevention package marked each period of use of the supplies

2.3 Disaster prevention package items

In accordance with the law bars specify that the contents of the disaster prevention and relief supplies, including drinking water, food and other necessities, first aid with medical equipment and medicines, essential for human life rescue apparatus and equipment, construction equipment, building materials and other emergency measures, as well as other necessary supplies and equipment, etc. Because the range is too wide, businesses streamline the prevention and relief supplies types. The disaster prevention package items including emergency lighting, food, emergency relief equipment, first aid supplies, warm items.

The international Rescue Instructors Association's coach Ye Taxing through the power of television media, strong advocacy disaster relief packages the importance of human life. Sharing search and rescue experience, that the necessary supplies emergency must contain Flashlight Radio Dynamo charging treble whistle, moisture-proof box, (Chocolate + rye rations 1 package + nutritional meal replacement the rod 3 + drying m 2), moisture-proof box (potato chips and a small box, when the fire), a group of silver insulation blanket, dust masks, first-aid kit 11 items.

British Special Forces (SAS, Special Air Service)[3], the issue of all-round "SAS Survival Handbook" is published in disaster prevention package can be mainly divided into life-saving boxes as well as life-saving package and lifesaving boxes. The box has matches, candles, flint, magnifying glass, compass, sewing, folding blade, whistle, medicines, etc. Most families in Japan are equipped with disaster prevention package that developed different user needs. The disaster prevention package contents items preliminary summarized in Table 1.

Table 1 disaster prevention package content items List

Category	Product
emergency lighting	ccandles, matches, glow sticks, flashlights, radios, batteries, etc.
food*	dry food, water, ultra-calorie chocolate, nutritional meal replacement, etc.
emergency relief equipment	whistle, rope, tools, knife, compass, map, Swiss Army Knife, etc.
emergency medical supplies*	OK stretched, tourniquet, hand towel, Betadine, sterile cotton + gauze + breathable tape, saline, gastrointestinal drugs, analgesics, anti-mosquito medicine, thermometer, safety pins, scissors, personal illness special medication, paper towels, tissuewait, etc.
warm items	raincoats, underwear, cold-proof waterproof clothing, socks, hats, gloves, life-saving blankets, tents, etc.
other	sstationery (notebooks, pens), backing up the key, photocopies of certificates, cash, glasses, etc.

Source: this research; * it is emergency life support supplies and periodically need maintenance supplies

2.4 The emergency medical supplies and save lives

The emergency medical kits can be divided into two types, including the medical special package with general household essential. The disaster prevention package is used in emergency shelter, mainly family necessary. The items with shelf life via this study collected data, as shown in Table 2. Auxiliary items including a thermometer, scissors, tweezers, triangular bandage, cold and hot packs bags, not included in the scope of the study. Save lives of the various items into 1-year, 3-year and five-year, in this study, the main object is to save time for 1-3 years that preliminary study for physiological saline and iodine syrup.

Table 2 emergency medical kits and supplies and save lives

product		save time
saline water		3 years
betadine		1 years
medical alcohol		1-3 years
anti-inflammatory	tetracycline	3 years
cream	streptomycin and other antimicrobial agents	3 years
vaseline		3-5 years
swabs		3 years
tampons		3 years
gauze		3 years
tape		3 years
OK stretched		3 years

Source: This study

2.5 The visual communication design

To convey broad point of view, including all methods affect others, such as articles, talk, music, painting, dance, etc., as well as all human behavior, and divided into convey verbal and non-verbal communication. The visual communication is non-verbal convey that including posters, signs, flyers, product packaging, book design, even in all kinds of images. It is through visual form to convey certain things for the purpose of proactive behavior (Wikipedia, 2013).

Visual design elements include structural design and graphic design [9]. Structural design includes shape, material and texture, and graphic design includes graphics, text, layout and color. The human visual system has the ability to distinguish between colors, color gives the feelings of the heart, it will produce the color association, Such as good / bad, dynamic / static, etc. The application surface expandable affairs color management, For example: materials, space, scene, person, security, and life, corporate, administrative. The visual color management, regardless of the elderly young children, is quite high degree of recognition, interpretation of communication to convey easy. Therefore, the study is expected to use color management to convey media use as disaster prevention package maintenance.

2.6 Symbolism of Colors

The visual communication variety of information for people to receive memory most quickly and directly, the color can provide further Lenovo, people impress [7]. The Colors used in the environmental space, directly have an effect on the eye, causing visual changes, people of color imagination [1]. The feeling of people of color will be the individual's age, gender, cognitive, folk beliefs and living environment factors. But the imagination of some color, in cultural context or the majority interlinked become common to imagine the color, also called a symbol of the so-called color. This study is summarized in Table 3. The study is expected to using colors according to their abstract imagination, terrorist imagine using black, gray with negative imagination, and red with a dangerous imagine, as a selection of colors.

Table 3 list of color imagine

hue	specific imagination (with similar)	the abstract imagination (symbolic)
red	fire, blood, apples, cherries	enthusiastic, positive, happy, dangerous, angry
orange	citrus orange, flame, Kaibab	cheerful, warm, mature, distinctive
yellow	bananas, egg yolk, sun	light, hope, flighty, uncertain, noble
green	trees, grass, pastoral	peace, security, youth, young, environmentally friendly
blue	ocean, sky	quiet, rational, broad, depression, free
purple	grapes, eggplant	luxurious, elegant, soft, mysterious, uneasy
black	hair, charcoal, crow, ink	heavy, terrorism, serious, sad, mysterious
white	cloud, cotton, snow, nurses,	clean, holy, fresh, deserted, pure
gray	ground, dark clouds, stone	simple, passive, gentle, modest, stable

Source: Chen Chi-Peng

2.7 Material

The packaging materials can be divided into the plastic bottle, face sticker material, plastic sleeve film, as shown in Figure 2. Graphic printed on the packaging of the bottle body, users have difficulty interpreting text, Wrapping paper affixed to the outside of the bottle, because time becomes blurred or stains, resulting in can't be read, printed on the plastic sleeve film, because the removal or packaging and lose the necessary message. At the same time, to consider the items opened bottle design involving mold, costly, and manufactured by different vendors. In this study, the most simple way, the use of media properties and color combination as maintenance of the emergency medical kits.



Figure 2 emergency medical kits items package

By different processing methods, to create a variety of paper, and the physical properties of the paper. Quite a few types of paper are shown in Table 3, the study's selection of wrapping paper. Quite a lot of the kind of paper to create a variety of paper, and the physical properties of the paper through the different processing methods, shown in Table 3, the study's selection of wrapping paper.

Table 3 the type of paper

category	The name of the paper
cultural paper	art paper, LWC paper, wood free paper, newsprint, Bible paper etc.
industrial paper	kraft board, corrugating medium, coated white board, gray cardboard
packaging paper	cellophane, wrapping paper, sack kraft paper
household paper	toilet paper, facial tissue, diapers, napkins, paper towels, medical paper
Information paper	non-carbon paper, photocopy paper, computer report paper, thermal recording paper (fax paper), electrostatic recording paper
special paper	tissue paper, rice paper, greaseproof paper, banknote paper, etc.

Source: Wai Hing Enterprise

The experimental phase of the study will be mining for packaging paper and color experiments, the final target select low-cost, simple processing methods. Causing the change in color of the paper based on the physical properties of the paper, the air of the environment, humidity, temperature, pH and processing methods are described below.

- (1) Role of pH: pH less than 7, the pure cellulose paper becomes slightly acidic environment, and storage time will reduce the pH of the paper for paper embrittlement, paper strength diminishes, and cause paper discoloration (also known as back color).
- (2) Thermo sensitive principle: can cause discoloration of the paper material, coated in an ordinary paper base particulate powder component is a colorless dye phenol or other acidic substances, is separated from the thin film, under heat, the film is melted, from the powder mixing chromogenic reaction.
- (3) Chemical admixture: Inks add special chemical color markers, use color matching agent, can produce specific discoloration reaction, user-friendly identification variable colors which like red, blue, black, yellow, green five kinds.

3. The study findings

This study investigated the area selected Taichung and Nantou counties, these two cities is 921 earthquake-hit areas. Main concern due to the affected people and ideas for more active prevention. Because the government has introduced in the disaster area distribution of this disaster package and understanding of the public use of the experience. This study is also concerned prevention package holds rates. Preliminary understanding of its causes, expect to find the cause and make recommendations. This study used a random sample survey network. A total of 112 questionnaires were recovered, of which 96 were valid questionnaires, 16 were invalid questionnaires. The data analysis results are analyzed as follows:

- (1) The subject's background information (age, gender, region)

Subject's background analysis as shown in Table 4. Living in Taichung subjects was 77, accounting for 80.20 % overall subjects. Living in Nantou subjects to 19, accounting for 19.80% overall subjects. Gender component that living in Taichung female subjects accounted for 51.04% of male subjects were 29.16%; Living in Nantou female subjects were 10.42%, male subjects were 9.38%. Overall, the proportion of female than male subjects. Age section contains all ages. 11-20 years old accounted for 11.46%, 21-30 years old accounted for 60.42%, 31-40 years old accounted for 25%, 41-50 years old accounted for 2.08%, 71-80 years old accounted for 1.04%.

Table4 background data analysis

region	Number of questionnaires	gender		age structure (years old)							
		Female	Male	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
Taichung	77	49	28	F 0 M 0	F 4 M 4	F 32 M 13	F 12 M 10	F 1 M 1	F 0 M 0	F 0 M 0	F 0 M 0
Nantou	19	10	9	F 0 M 0	F 3 M 0	F 6 M 7	F 1 M 1	F 0 M 0	F 0 M 0	F 0 M 0	F 0 M 1

Subject's background data analysis results are as follows:

- A. Living in Taichung subjects above 80%, should be judged Taichung is a municipality and the metropolitan area. People use the Internet penetration rate is higher, because this study the impact of Internet questionnaire.
- B. Female response rate is accounted for 61.48% than men, because traditional family division of men outside the women inside, most of the management and maintenance of household items for females operation.
- C. Ages section 21-40 years-old are all higher than other ages section. Representation on behalf of this age group has a higher consciousness of disaster prevention, especially Female.

(2) Analysis of survey results

The survey results are set out in Table 5, only 18.75% people have disaster prevention package held, Taichung and Nantou was 5.2% overall disaster prevention package holds only 23.95%; holds disaster prevention package sources to purchase up to 52.17%, followed by government units donated accounted 30.44%, friends and relatives donated to 4.35%, and other sources accounted for 13.04%; respond tested periodically checks accounted for 47.83% of the whole held, will not be checked regularly accounted for 52.17%; frequency of checks for more than half a year for less than one year accounted for 72.73% less than two years for more than a year, accounting for 18.18%, 9.09% more than two years, as shown in Table 6.

Table 5 investigate the use and maintenance of Disaster prevention package results

item region	Holds rate		Sources of Disaster prevention package				Periodic inspection	
	no	have	Government units donated	Friends and relatives gift	Their own purchase	other	Can	Will not
Taichung	59	18	3	1	12	2	10	8
Nantou	14	5	4	0	0	1	1	4
Subtotal	73	23	7	1	12	3	11	12

Table 6 responds to the subjects regularly check time

time region	More than six months for less than one yea	Less than two years for more than a year	More than two years
Taichung	7	2	1
Nantou	1	0	0
Subtotal	8	2	1

Analysis results are as follows:

- A. Disaster prevention package holds only 23.95%, judged yet to popularize and implement the handling of promotional activities for disaster generated self-concept of emergency relief, and the people pay less attention to the findings available for disaster business units assess disaster prevention the effectiveness of the promotion and implementation of the exercise.
- B. Source of disaster prevention package to purchase more, accounting for 52.17%, indicating that people have a sound concept of disaster prevention, people will take the initiative to prepare disaster prevention items accounting for 30.44%; presented by government agencies, visible government agencies to promote disaster prevention and relief activities, still has results.
- C. Held by the people of the disaster prevention package will regularly check to 47.83%, less than 50%, showing that people do not attach importance to the use and management of disaster prevention package more.
- D. Check frequency less than one year to more than half a year up to 72.73%, in line with the cycle of the half-yearly examination.

In order to understand the people use disaster prevention package maintenance and management , the questionnaire also asked had encountered in the use of management and maintenance problems, shown in Table 7.

Table 7 maintenance management problems encountered

Item	Frequency	Proportion
Shelf life text is too small	5	21.74%
only login date of manufacture need to Calculate deadline by use people, very trouble	3	13.04%
Retention period Login outer bags boxing unlabeled contents, causing distress	4	17.39%
Disaster prevention package contents too much, one by one to check the time-consuming	2	8.69%
Marked unknown interpretation difficulties	1	4.35%
Instructions complex	1	4.35%
Shelf life of a first-aid kit contents increased frequency of inspection time	5	21.74%
Disaster prevention package contents replacement of old formalities trouble	1	4.35%
Other	1	4.35%

By measured by two largest Includes shelf life text too small and first-aid kit of various contents save deadline different (Figure 3), check the time frequency increase, two are accounting for 21.74%; followed by shelf life login on the outer boxon the box (Figure 4), the contents of unlabeled accounting for 17.39%; Furthermore for only login date of manufacture (Figure 5) or the useful life (Figure 6), the deadline manual projection accounted for 13.04%, the rest of Disaster Prevention and package contents are too many accounted for 8.69% of the time-consuming, each inspection.

The foregoing accounting for 82.6% of the overall maintenance difficult. Findings maintenance management difficulties, point directly to the registry items shelf life, enhance disaster prevention package holds rate the use of maintenance management difficulties, intended to be difficult to solve for this section, be held, in order to enhance disaster prevention package.



Figure3 icon text is too small and not easy to read



Figure 4 marked on the outer box

Figure 5 shelf life is marked unknown



Figure 6 only log on for three years, own calculations.

4. Conclusions

The work of disaster prevention, disaster prevention package is an indispensable necessity. Preliminary findings indicate that the Government's education advocacy activities, although with some success. But, people still lack of disaster preparedness action. Response in ownership rate of disaster prevention package is low.

Maintenance and management is not easy, it is one of the with disaster prevention package holds rates low. Hold disaster prevention package by maintenance and management difficulties, as the core issue, upon the design improvements can increase holds rate. Taichung and Nantou received major natural disasters, public disaster

prevention package holds only 23%, is the demonstration of advocacy for disaster prevention and relief have been implemented, and spread a warning, the next government also needs to more actively involved in .

Advanced In this study, based on survey results, the second phase of disaster prevention package maintenance and management of the visual design, and look forward to simplify the maintenance process to improve the convenience of the public, to encourage people to prepare disaster prevention package.

5. References

- [1] Chen Chi-peng, (2000), *The study of the relationship of color aesthetics and urban and rural landscape*, color application and color science seminar Proceedings, pp. 185-201.
- [2] Huang-Hsiung Hsu, Chen, Mong-Ming Lu, Chen Yongming, Zhou Jia, Wuyi Zhao, (2011), *Taiwan climate change science report*, National Science Council
- [3] John Wiseman , Lai in Qinghe, the Luo Weiguang, Cai Mingxiu translation, (1996), *SAS comprehensive survival manual*. Macro-cultural publishing, Taipei.
- [4] Lu Xiaoyun, (2008), *Analysis of pharmaceutical packaging design based on the need of elderly patients*. Nantong University Nantong 226007, pp.101-157.
- [5] Liu Li, Ren-Ping Xu, Liu Hong, (2005), *Packaging design information transfer*, Packaging Engineering, vol. 26, no. 5, pp 187-193.
- [6] Mileti, D. S. (1999), *Disaster by Design: A Reassessment of National Hazards in the United States*, Washington DC: Joseph Henry Press.
- [7] Rao,Zhen-Jiang, (2005), *The the poster text layout design and color of the text to grasp the breadth of the impact of visual Thesis*, National Taipei University of Technology and Design Institute.
- [8] Sheng Tian Ying Fu, Gung Ye Dau Shiung, (2010), *Elderly awareness of disaster prevention disaster supplies in the house*. Conference of the Architectural Institute of Japan academic lecture takes set
- [9] Yu Hong-yi, (2006), *Product packaging design and brand building*, [Online PDF], Available at <<http://coa.cpc.org.tw/edu/Class/doc/95/%E8%AC%9B%E7%BE%A9.pdf>> [Accessed 2012].