

A Proposal of New Interface Based on Natural Phenomena and so on (1)

Toshiki Yamaoka¹, Ichiro Hirata¹, Akio Fujiwara¹, Sachie Yamamoto¹,
Daijirou Yamaguchi², Mayuko Yoshida², and Rie Tutui¹

¹ Wakayama University, Faculty of Systems Engineering
Sakaedani 930, Wakayama City, Japan

yamaoka@sys.wakayama-u.ac.jp, ichiro@hyogo-kgo.ac.jp,
{s5048,s105059@sys.wakayama-u.ac.jp}, 2mail2mail@hotmail.co.jp,
085061@sys.wakayama-u.ac.jp, s115037@sys.wakayama-u.ac.jp

Abstract. This study aimed at creating new user-interfaces based on natural phenomena, objects, accustomed manners and so on. At first, literature and script survey was conducted to get framework of the study. Next, 33 places like famous garden, castle, temple and so on in Japan were surveyed to get clue of creating new user-interfaces. New user-interfaces were created based on a lot of collected data. The three selected user-interface design were visualized to evaluate from the viewpoint of usability and emotion and so on. These user-interfaces were evaluated highly.

Keywords: user-interface, natural phenomena, manners, behavior, observation.

1 Introduction

Occasionally user-interface designers have created a new interface imaging or referring human or animal action, and natural existence like tree, flower and river and so on. So, imaging or referring them is very important for their designing. For an example, the user-interface of iPod was designed based on human action which is used in daily life. However, these user-interfaces based on human behavior and natural phenomena have not examined systematically. In the study new findings are discovered in any places from Hokkaido island (Northern island) to Okinawa island (Southern island) in Japan.

2 Literature and Script Survey

A lot of literature was collected in order to survey Japanese manners, customs and design in Japanese architecture, garden and so on in association with user-interface. The findings of the survey were classified into 3 groups below.

1. Accustomed manners friendly
 - a. dwelling
 - b. utensil
 - c. behavior, manners
2. Natural phenomena
3. Movement, behavior of plants and animals

As next step, a lot of script were collected by discussing. The script means knowledge as to a series of behavior under a situation. The script were classified into 2 groups.

1. Daily script: cooking, bathing, taking a train, eat in restaurant and so on
2. Script without daily life: going to amusement park, staying at hotel and so on

A new user-interface can be created by the above mentioned findings. A good example is shown below.

Example: There is two kinds of slope on a hill of shrine in Japan. One is called as the Man slope which is steep, and another is called as the Woman slope which is gentle. It does not take much time to go over the Man slope. On the other hand, much time to go over the Woman slope.

This means the slope was designed according to ability of a human. The fact suggests that some kinds of user-interface is needed according to user's skill.

3 Field Survey and New User Interface

Accustomed manners and objects in a field survey were collected. 33 surveyed places are as follows.

1. Hokkaido: Asahiyama zoo
2. Tokyo: famous park, garden, temple, shrine, department store and so on
3. Kyoto: famous temple, shrine, castle, market and so on
4. Kyuusyuu: famous garden, shrine, museum, castle
5. Okinawa: former Nakijin castle, the Ocean Expo Park, market and so on

3.1 Exploring User Interface Based on Accustomed Manners and Objects

The collected data were classified into 4 groups below.

1. Architecture: entrance, stairs, corridor, wall, window, door, roof and so on. Change, emphasis and flexibility of space were observed.
2. Utensil, object: clothing, sign, vehicle, signboard, display, product and so on. Elements that show user's situation like distance to goal and direction were observed.
3. Behavior, manners: while eating, customs, hospitality, wording and so on. Method or clue to provide information was observed.
4. Environment: garden, tree, sound, smell, water, road, space and so on. Elements guided user like navigation, emphasis, informing present location were observed.

A lot of user-interfaces were created based on the above mentioned 4 groups. Six examples are shown below. Collected data were analyzed from the viewpoint of "scene", "components" and "user-interface".

1. Example1

- a. a scene: There is two observing routes in a hall of the Asahiyama zoo.
- b. components: two different routes
- c. a new user-interface: select the route according to situation.



Fig. 1. Two routes displayed at the entrance

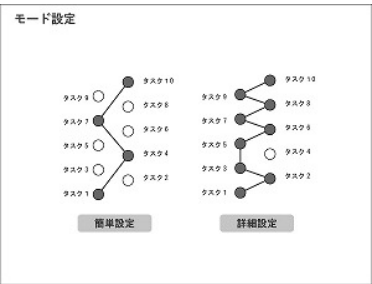


Fig. 2. A new user interface

2. Example2

- a. a scene: the site of former Nakijin castle
- b. components: combination of 3 steps + landing +5 steps +landing +7steps at stairs
- c. a new user-interface: operate rhythmically without monotony



Fig. 3. The site of former Nakijin castle.

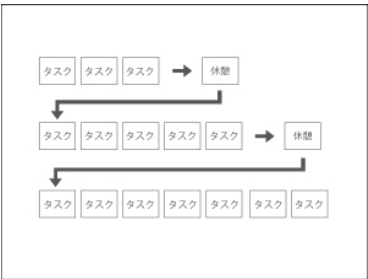


Fig. 4. A new user interface

3. Example3

- a. a scene: window of temple
- b. components: cut off a part of scene from scene
- c. a new user-interface: focus on the emphasized part



Fig. 5. A window of temple

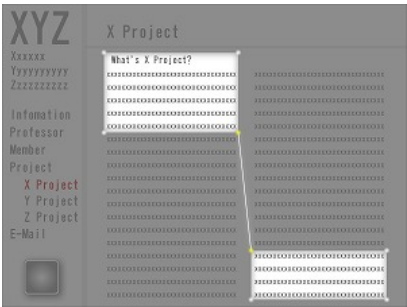


Fig. 6. A new user-interface

4. Example4

- a. a scene: look up a leopard in a cage of the Asahi-yama zoo
- b. components: look up animals
- c. a new user-interface: look an object from various viewpoint



Fig. 7. Look up animals

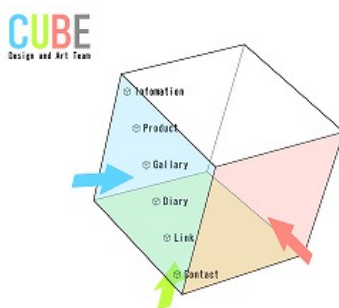


Fig. 8. A new user-interface

5. Example5

- a. a scene: go through a shop curtain
- b. components: be able to see the inside
- c. a new user-interface: see next page partly



Fig. 9. Shop curtain



Fig. 10. New user interface



Fig. 11. A picture scroll

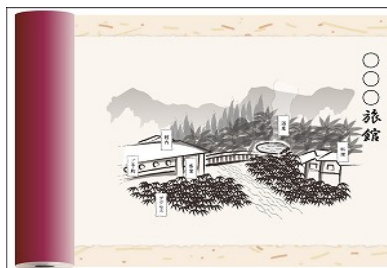


Fig. 12. A new user interface

6. Example6

- a. a scene: look at a picture scroll
- b. components: a scroll
- c. a new user-interface: display all information on one page

3.2 Exploring User Interface Based on Natural Phenomena

A lot of data were collected in the field survey. The collected data were classified into 4 groups below.

1. mountain: marvelous shape of rock, surface of mountain, summit of mountain, Gently-sloping hill and so on. Elements that inform user of present location and season's change were observed.
2. sea: vast expanse of sea, water's edge, surface of water, sound of water, water vapor, steam, sandy beach, shore and so on. Movement like wave was observed.
3. sky: cloud, rainbow, blue sky, sea of cloud, morning sun, sunset and so on. Elements about lapse of time, direction and weather were observed.
4. the others: weathering, sunlight filtering down through trees, sunny place, smoke and so on. A lot of user-interfaces were created based on the above mentioned 4 groups.

Two examples are shown below. Collected data were analyzed from the viewpoint of "scene", "components" and "user-interface".

1. Example1.

- a. a scene: summit of mountain and mountain trail
- b. components: sky, trees, trees and plants, open space
- c. a new user-interface: flexible interface

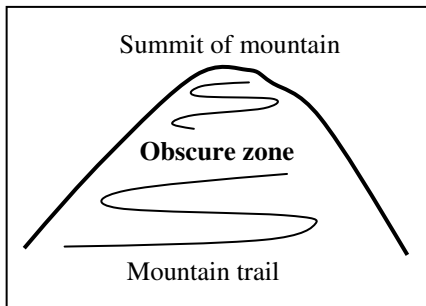


Fig. 13. Mountain trail

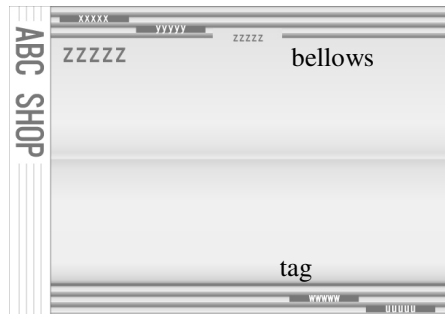


Fig. 14. New user interface

2. Example2

- a. a scene: surface of water
- b. components: surface, light, plants
- c. a new user-interface: navigated user-interface



Fig. 15. Surface of water

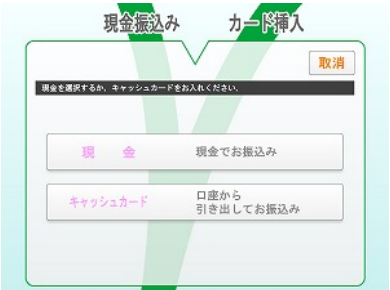


Fig. 16. New user interface

3.3 Exploring User Interface Based on Movement and Behavior of Plants and Animals

A lot of data were collected in the field survey. The collected data were classified into 4 groups below.

1. Dynamic movement and behavior with movement. Elements with speed and movement were observed.
2. Dynamic movement and behavior without movement. Elements which inform active, understanding of response, etc were observed.
3. Static movement and behavior. Static situations were observed.
4. Plants. Elements which display a situation and change were observed. A lot of user-interfaces were created based on the above mentioned 4 groups. One example is shown below. Collected data were analyzed from the viewpoint of “scene”, “components” and “user-interface”.

1. Example
 - a. a scene: fishes gathered to get bait
 - b. components: a lot of fish, gather
 - c. a new user-interface: gather information which are related.



Fig. 17. Fish gathered to get bait

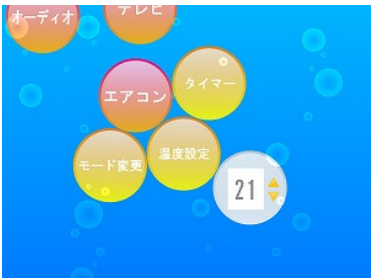


Fig. 18. New user interface

4 Evaluation of New User Interface

Three user-interfaces were selected in order to evaluate.



Fig. 19. Design 1
A new user-interface with scroll function

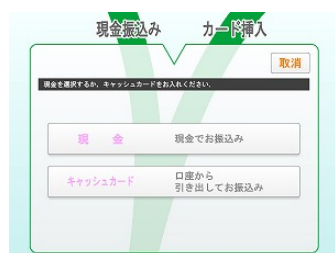


Fig. 20. Design2
A new user-interface with direction

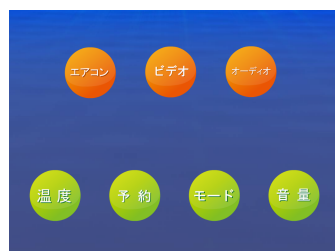


Fig. 21. Design3
A new user-interface gathered related information

1. Method.

The three user-interfaces were visualized as real interface of products. Participants: 16 persons (male:2, female:14) businessman, housewife. Method: Participants answered questions looking at the user-interface design. Questionnaire: items regarding layout, color, operation, easy to see, usability characteristics of a new user-interface

2. Results and discussion.

Design1. Generally, design1 has good results. Especially, the emotional aspect is evaluated highly.

Design2. While interface aspects are evaluated highly, the navigation is not evaluated. Although the navigation is good idea, the design is not so good.

Design3. The interface of design3 is evaluated highly because of new function and the convenience.

5 Conclusion

User-interface focused on screen like operational panel becomes very important in any products. This study is aimed at creating new user-interfaces based on natural phenomena, object, accustomed manners and so on. As we've lived in nature, it is very reasonable to apply the dispensation of nature to an user-interface. And, by observing manners and objects influenced by natural climate, we can construct an user-friendly interface easily. As animal and plants makes us calm down, factors of the calm cause emotional interface which is familiar to us. A lot of new and original user-interfaces were created based on natural phenomena, object, accustomed manners and so on in this study.