* Report Introduction (Chapter Introduction)

The purpose of this paper is to help people understand some basic concepts of the interactive product design principles. With some examples from the m8r-Sim, it allows people to understand the conceptions of the design principles better, distinguish each characteristic easier. Firstly, this paper discusses some concepts of the design principles. Then it points out some examples about the objects in everyday life to explain these concepts. These examples can help people find the necessity of some product design principles such as visibility, affordance. Also, it includes some opinions from psychological and physics points of view. Finally, it encourages people to use these principles to design objects and change their perspectives about the world.

First, in the chapter one of the Donald Norman’s The Design of Everyday Things, the author compares two types of doors’ design and introduce people the visibility, one of the most important design principles, it means that object should contain visible components to let people know how to use it. Then he uses his bad experience about the elegant projector, new telephone systems and Italian washer-drier to let people know the importance of the visibility. Also, he adds some common emotions and logical reasoning to support his views. Then, he puts out the affordances and use British rail shelters’ materials as an example to illustrate that affordance provide strong clues for user to operate the objects. Also, he finds the more parts an object is made of, the more complex its functions and the more difficult it is for people to understand how to manipulate it. Then, he uses refrigerator example to bring out the topic that how important for using a good conceptual model to design object. Similarly, he also considers the connection between the visibility, constrains and mapping in order to find some structural clues within object. Then, he uses the new telephone system again to explain the needs for user participation in the object design process. After that he shows some layouts of telephone number and introduce the consistency. He mentions that it is a good design that single control matches single function of the object, and it is easier for people to learn and to use the object at this situation. Then, he talks about the mapping relationship between object’s function and environment regular pattern. At the same time, he talks about the seat adjustment control and speaker selector in the car in order to prove that mapping is also important. Then, he finds feedback is also necessary for people to understand what they did on object. Also, he is considering the balance of the cost and usability. With the increase of the object’s functions, the need of constrain is significant, it could help people avoid taking more mistakes. Finally, he points out that a good design is not just a simple mix all the functions into one product, but also considers many factors, such as cost, usability, aesthetics, etc.

* Human-Centered Design and the need for it in CS/IS

The human-center design is not just design for the human, but also use human-based design methods to satisfactory the user. In the perspective of software development model, it combines the iterative model and spiral model. The most important thing is that user participate the requirements established, project design, prototype evaluation etc. processes during the development process. So, the developer can easily understand what the user experience is currently, why a change is need, how this change will improve user experience. After talking with users, they can know how to design physical interface and what technologies and interaction styles to use. Also, it is benefit for the users. Because the user participates the development process, they will have a sense of identity and satisfaction with the product.

* What are Affordances?

Affordance is a kind of relationship between an object and some actions that user can take with that object.

* + Strength and Weakness of m8r-Sim.

Strength: user can find tutorial and start game button and texture box. So, user can choose different function by typing or press the button.

Weakness: when user open the main menu, they put cursor into introduction word, it just increases font size and change font color. It doesn’t tell user what the next step is. So, user will confuse about that.

* What are Signifiers?

Signifier is a kind of clue that allow user to know how to interact with the objects.

* + Strength and Weakness of m8r-Sim.

Strength: when user enter the train model, it will show next signal and right mouse signal which clue user to press right mouse button in order to get into next step.

Weakness: user can press E key to control ROV move up, and press Q key to control ROV move down. But the word Up/Down signal is located between the E and Q signals, user can not distinguish them clearly.

* What is Mapping?

Mapping is a direct relationship between the object’s movement and the national environment regular pattern.

* + Strength and Weakness of m8r-Sim.

Strength: when the user chooses front camera view, the user move mouse toward to the left, the view will rotate toward to the left. It can help user better find the target.

Weakness:

* What is Feedback?

Feedback is a kind of actions that offered by the object when user take interacts with that object.

* + Strength and Weakness of m8r-Sim.

Strength: When the user use manipulator closed to the sea star and press the left mouse button, the screen will show how much score do the user get. That is a good example for feedback. Based on that, user can easily know whether it is successfully catching the sea star.

Weakness: when user enter the introduction interface, clicking stop button or sliding process bar, it seems nothing happen. So, user maybe confuse whether the functions of these components is good or not.

* What are Conceptual Models?

Conceptual Model is a kind of model from the real world, it contains many concepts which help user understand the functions of the object, interaction between objects.

* + Strength and Weakness of m8r-Sim.

Strength: when user press tap button, the screen will show operational panel which contains all the operation people need to do. For example, using WASD key to control the movement of ahead, left, back, right. So, user can operate the robot while seeing the operation explain panel.

Weakness: system doesn’t show the relationship between the options function and key component. So, user can hardly find this function.

* Report Conclusion

The lessons we learned:

Reasonable use of multiple design principles to design the product. Carefully consider product design from multiple perspectives to satisfy different groups of people. Minimize the number of external links which lead user jump out of the application. Accurate handle the relationship between user operations and system components.

The interesting and important parts for computing:

The direct connection between product design and users’ daily experience and user’s expectations for new products make the discussion interesting and important. Also, using these design concepts may help product developer easier and quicker design products.

Benefit of this paper:

It teaches me to using different perspectives to consider the construction, operation and function of product design. For the design, it is not only focus on how many function the product contain, but also pay close attention to the relationship between the user operation, experience and product function.