A Case Study on Development of Design Identity for Service Robot

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1. Introduction

Today, many products receive the labels “intelligent” and “robotic”. Robot markets will inevitably expand. Indeed, World Robotics expects the robot industry to have a market value over $420 billion by 2020. Both technological and strategic differentiation is needed for companies to hold a dominant market position. Corporate identity helps bolster a company’s market value. Establishment of the former can be accomplished by focusing on two avenues: by unifying and managing image and by delivering differentiated images to the consumer. It has been applied to companies, brands and products. In the brainiest age, strategic differentiation in the service robot market will be needed. So, in this study, we paved the way for robot identity building and developed a design identity for service robots.

2. Robot Identity

New factors have to be considered in the design of robot identity because robots are characteristically different from other products. In this study, we defined elements that make up the robot identity.

2.1. Product Identity

After surveying the literature, we came up with several elements that compose identity. We divided these elements into two groups: visible and invisible. Visible elements are general form, certain line or style, color & material, interface, logo & typeface, and manual. In addition, invisible elements are management principle & philosophy, technology, peculiar function, function which making difference, interface, and marketing.

2.2. Characteristics and Elements of Robot for Identity Building

Robot design area can be divided into 3. First one is character design which defines role of robot and service area. And second one is appearance design. And the third one is interaction design which is related to entire communication between users and robots. So, in order to establish robot identity, Functionality characteristics of robots have to be reflected in the overall shape of a robot.

2-3. Characteristics and Elements of Robot to Consider for Identity Building

I mentioned that elements of composing identity are divided into visible and invisible. When considering characteristics of robots as intelligent products, philosophy of companies which make robots, principle at which robots aim, peculiar function that robots perform can be invisible elements. Physical elements of design such as form, material, color, interaction, and graphic can be defined visible elements. Based on these, elements defining robot identity can be divided into three groups: Robot Philosophy; abstract images pertaining to appearance and service concept of robots, Functional Affordance; image keywords about characters of service and functional properties that each robot perform and, Family Look; visible factors which represent unified images on appearance of robots. Among them, Robot Philosophy and Functional Affordance are invisible; Family Look is a visible factor within which philosophy and function are expressed.

3. Case of Robot Identity Development

We designed identity of several robots that perform various services in one commercial place. Our work differs from previous research in that this identity is for robots made in different companies each other which provide their peculiar services each. In other words, this identity is for robots in same purpose place.

3.1. Outline of Case

Tomorrow City is a state-of-the-art city meant to unite communication infra and ubiquitous information services into one city. It will be completed to construct on August, 2009 in the Incheon Free Economic Zone. We designed the identity of guide, serving, road guidance, patrol, and advertising robots to be used in this city. We call them “Tomorrobot”.

Key words: Product Identity, Robot Identity, RI
3.2. Definition of Elements comprising Robot Identity
We tailored our Robot Philosophy to reflect concepts of commercial place that robots will be conduct. They are 3. The first list of Robot Philosophy is smart. It means that robots must perform their roles completely and the second one is user-friendly that means robots must make users feel friendly. Last, it is convenient. It means that users can use robots conveniently. Moreover, we set keywords regarding robot character of service and functional properties. Guide robot’s keywords that represent Functional Affordance are friendly, kind, intelligent, and accessible. Those of serving robots are diligent, gentle, lively, and reliable. Guide robot of the road has 4 keywords of collaborative, careful, durable, and mobile. Patrol robot’s are security, safe, reliable, responsible, and robust. Advertising robot’s are entertaining, active, affinity, and attractive. Also, we selected and defined visible elements in order to make Family Look. There are 3 kinds of elements in Family Look. First one is form factor. Form factor is a general form and characteristic shape that make robot’s style. Next, it is color & material. It indicates main color and point color on parts that form factor was applied and material which form factor and color was applied. The third one is logo & graphic. It contains brand name, logo, and graphic that can be used to all kinds of robots’ platform.

3.3. Development Process
We concretize form factor, color and material and logo of family look based on defined robot philosophy and functional affordance. Application of the same form factor to several robots is nontrivial because of differences in functionality. Therefore, we did not require the form factor to be expressed over the entire body. On the other hand, we set compulsion rate of color and material application higher than Form Factor, and also arranged compulsion rate of logo for the highest.

3.3.1. Form Factor
We suggested a three dimensional streamlined character line that can be applied to robot’s body after thinking over robot’s function. It can be embodied in the form of parting line or parting piece as the Possibility of each robot’s platform modification. In addition we created light rings which can be embodied on the parts of joints and wheels in arms and legs of five types of robots in order to emphasize the Family Look.

3.3.2. Color and Material
We classified the colors and materials used in making the robots into three categories. Type1 is that main color is neutral such as gray, white, and silver and point color are painted on partial body. Type2 is that chromatic and neutral color is colored at the rate of half and half. Type3 is that applying point color on a harmonized 2kinds of neutral color colored overall body. In addition, we collected each robot company’s point of view and then we decided robot’s body color & material as white pearl and chose each robot’s character color that can be represent each robot’s role and character.

3.3.3. Logotype
We designed a logo and pet-name for the Tomorrobot. We suggest that the brand logo be applied to all five types of robots in the same way. In addition, we also suggest that the pet name logo be located on the space behind the brand logo. This serves to highlight robot uniqueness.

4. Conclusion
When designing robot identity, we have to keep in mind that users interact with robots which has its own characters unlike other products. Keeping this in mind, this study made use of current methods used to build product identity. However, we also tried to define and apply robot’s characters to factors of functional affordance. We also tried to identify design elements which mainly influence on making characters of robots in Family Look.

7. Reference