
Remote skincare advice system using life logs

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Abstract

A lot of women feel difficulty to keep their skin beautiful since skincare approaches require users various efforts, time, and special knowledge. Users often ask skincare advice of experts in cosmetic stores.

However, this approach has limitations of time, place, and personal information.

To solve these problems, we propose a remote skincare advice system using life logs.

This system helps users automatically log elements related to the skin condition and share these data with skincare experts to get advices.

Keywords

Skincare, advice, life log

ACM Classification Keywords

H.5.m Miscellaneous

General Terms

Human Factors, Management

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Introduction

A lot of women hope to be beautiful forever. They also want to keep their skins beautiful. According to the questionnaire survey about skincare in Japan¹, 90 percents of women have some skin troubles, and 80 percents of them are interested in skincare.

However, they often feel difficulty to keep skin beautiful, since the skin condition is related to various elements (e.g. ultraviolet rays, dry-conditions, the balance between male and female sex hormones, dietary habits, the length of sleeping hours, and the stress of daily life). According to the above questionnaire survey, only 60 percents skincare oriented women actually care for their skin. The survey also reported the difficulty of skincare is that they don't know the proper skincare methods. To complement the lack of knowledge, these women often ask skincare advice of experts in cosmetic stores. (We define this approach "face-to-face skincare advice"). However, this approach has limitations of time, place, and personal lifestyle. Moreover, according to the research by FANCL CORPORATION², many women feel hesitancy about face-to-face skincare advice. To solve this problem, we propose a remote skincare advice system using life logs called "Smart Skincare System (SSS)". Using the SSS, women can easily take logs of elements related to the skin condition by using the technique of life log, share these data with experts through the web, and obtain special advice from experts anytime at home.

Smart Skincare System (SSS)

This system consists of 3 components as follows:

1. http://www.herstory.co.jp/jisya/200412/20041208skin_trouble.html
2. <http://www.fancl.co.jp/corporate/news/data/2009.10.30bihadakantei.pdf>

- Smart Skincare Dresser
- Smart Skincare Charm
- Smart Skincare Adviser

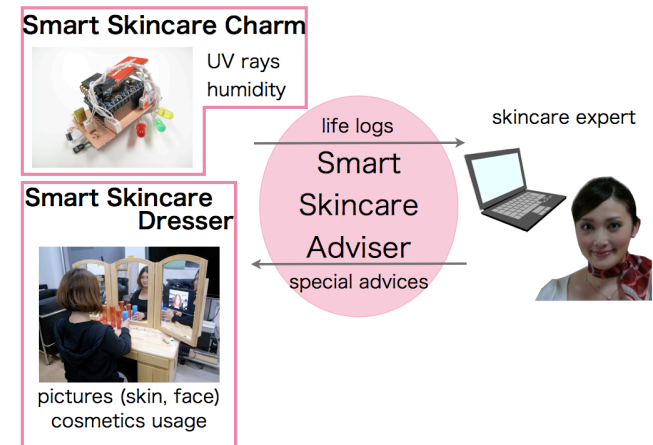


figure 1. Basic concept of Smart Skincare System

Smart Skincare Dresser is a device which helps users take photos of their faces and skins, and record usages of their cosmetics easily. Smart Skincare Charm is a mobile device that logs weather condition such as ultraviolet rays and humidity. Smart Skincare Adviser is a Web-based application in which users can share data (collected from Smart Skincare Dresser and Smart Skincare Charm) with the experts easily, and obtain advice of proper skincare methods.

Smart Skincare Dresser

The basic concepts of Smart Skincare Dresser are as follows.

- Collecting elements related to skin condition

- Special hardware suited for skincare use

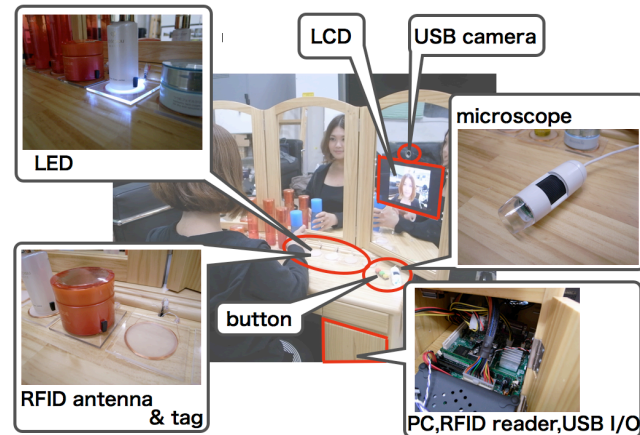


figure 2. Smart Skincare Dresser

First, Smart Skincare Dresser collects elements related to skin condition. Before the implementation, we asked a skincare expert who works at “Shiseido (a giant cosmetic company in Japan)” about requirements of skincare advice. According to her advice, we decided to collect 3 data: close-up pictures of skins, pictures of faces, and usages of cosmetics.

Close-up pictures of skins are used for analyzing abnormalities and metabolism of skins: pictures of faces are used for detecting sag and spots of skin: in-use cosmetics are used for checking ingredients and users’ tastes.

Therefore, we developed functions of taking pictures of skins and faces, and logging in-use cosmetics easily.

Second, we designed special hardware suited for skincare use since most women may not want to use computers in skincare time. Consequently, we attached all devices to a daily dresser since many women usually use dressers while caring for their skins.

The appearance of Smart Skincare Dresser is shown at figure.2.

Smart Skincare Dresser mainly consist of a USB microscope, a USB camera, an LCD monitor, cosmetics stands with white LEDs and RFID antennas, push buttons for operating, and a computer and other components (a RFID reader and an I/O board) attached inside a drawer. The LCD and the USB camera is embedded in a mirror for keeping the appearance of the dresser.

We attached 9 cosmetics stands on the top board of the dresser³. Each cosmetic stand consists of a RFID antenna and a white LED attached to 7cm x 7cm⁴ acrylic plate.

The RFID antennas are connected to a RFID reader attached inside the dresser. This RFID function helps users automatically log use of cosmetics (attached with RFID tags): that is, the system can detect which cosmetics in-use by watching existence of RFID tags.

The system also can inform users which cosmetics should be used next by turning on a corresponding LED.

3. Since skincare cosmetics are divided into 6 types (face lotion, milky lotion, special lotion, cream for massage, astringency lotion, and night-cream), we developed 9 stands on the safe side.

4. The plate size is determined in consideration of size of common cosmetics.

Users can take pictures of their skins and faces using physical buttons. We attached 3 buttons on the top panel of the dresser. These buttons work as (1) capturing skin pictures using a microscope, (2) capturing face pictures using a USB camera, and (3) canceling the operation.

We explain the process of taking pictures quickly. First, when a user pushes a capture button, a captured picture is shown in the display. Next, she/he can save the picture by pushing the same button one more time. Otherwise, she/he can cancel the operation by pushing the cancel button.

Thus, Smart Skincare Dresser enables users to easily log various elements related to skin condition without complicated operation.

Smart Skincare Charm

The basic concepts of Smart Skincare Charm are as follows.

- Logging ultraviolet rays and humidity
- Offering realtime feedback
- Suited for mobile use

First, Smart Skincare Charm can log 2 major elements related to skin condition: ultraviolet rays and humidity. As is well-known the ultraviolet rays and dry air have harmful influences on skins. However, most women were rather unconcerned about these elements since there were no methods to manage them easily. To solve these problems, we developed the logging function which can measure ultraviolet rays and humidity, and record the data to a memory card.

Second, Smart Skincare Charm offers realtime feedback for users. For example, when ultraviolet rays increase or humidity

rapidly decrease, the system gives warnings to users using build-in LEDs.

Third, Smart Skincare Charm is designed for mobile use. Although the Meteorological Agency provides basic data of ultraviolet rays and humidity, actual data may be different in each user's environment. For this reason, Smart Skincare Charm is designed as a compact device suited for mobile use.

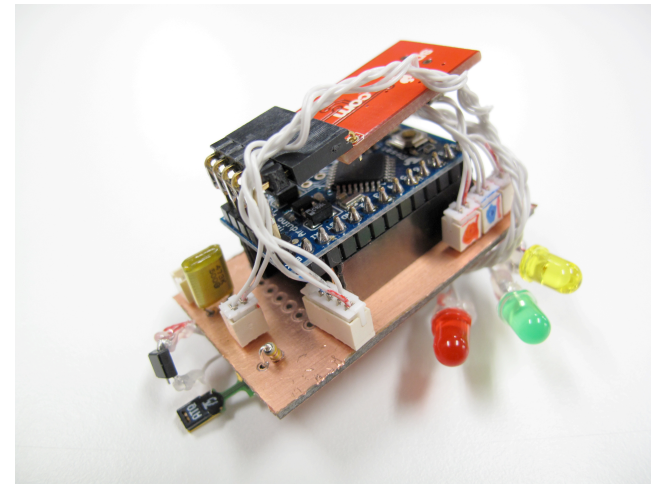


figure 3. Prototype of Skincare Charm

Figure.3 shows the prototype of Smart Skincare Charm.

Smart Skincare Charm consists of a UV sensor (Hamamatsu Photonics K.K. / G5842) and a humidity sensor (Sensirion AG / SHT75), three LEDs(red, green, yellow), a memory card (Transflash microSD card), a lithium-polymer battery, and a micro controller (Arduino Pro Mini) to control the above devices. This size of the whole device is about 5cm x 3cm x 3cm.

Next, we explain the system flow. When users carry Smart Skincare Charm, it automatically logs ultraviolet rays and humidity into the micro SD card every five minutes. When the UV data is changed to the specified UV index⁵ (3 or above incurrent), the red LED begins to blink. The blink speed becomes faster along with the UV rays become stronger. Moreover, when the humidity data is changed to less than 50 percents, the yellow LED begins to blink. Thus, users can easily notice the harmful influences of UV rays and dry air at once.

Preliminary evaluation

On this system, skincare experts have to give advice to users with digital data like photos instead of watching skin directly. To confirm whether experts could give proper advice, we performed a preliminary evaluation. The participants were two females (22-year-old under graduate student and 24-year-old graduate student). The expert was the above mentioned.

First, the participants took (1) pictures of their skins and faces, and (2) logs of cosmetics using Smart Skincare Dresser. They transmitted these data with unrestrained comments about their skin to the expert. Next the expert wrote advice in free format based on the data, and transmitted it to the participants. Then, the participants read the advice. Finally, we asked the participants for their impressions and opinions about Smart Skincare Dresser and the advice. We also asked the expert for her opinions about this system.

Result

The amount of the expert advice is about 2000 characters in Japanese, which are equivalent for about 1000 words in

⁵ The UV Index is proposed by the National Weather Service and EPA. It divides the strength of UV rays into 11 categories: 1 (low) to 11+ (extremely high).

English. The advice mainly consists of 4 parts: evaluations of skins, evaluations of face appearances, explanations of skin condition, and recommendation of skincare methods. Especially the advice mentioned causes of skin troubles and practical answers in usual skincare.

The impressions of participants are revealed as follows:

- The advice was easy to understand and helpful.
- Although I felt hesitancy about face-to-face skincare advice, I want to use this system continuously.
- Smart Skincare Dresser was easy to use.

The impressions of the expert are revealed as follows:

- I could give the appropriate advice only with digital data.
- This system is suitable for customers who don't like face-to-face skincare advice. This system is also useful for an option of face-to-face skincare advice.

According to her opinion, the ultraviolet rays and humidity data from Smart Skincare Charm will be useful in giving advice more properly. She also mentioned that sleeping hours and the basal body temperature are also desirable.

As a result, using digital data taken by Smart Skincare Dresser, the expert can give appropriate advice that satisfies users. Thus this system is useful for both users and experts.

Moreover, for the more useful advice, we have to consider that taking data of sleeping hours and the balance between male and female sex hormones.

Related works

A technique of automatic evaluation of skins is developed to support women keep their skin beautiful [1]. Although there were many studies for beautiful skins, most of them focused on analyzing skin condition. Our system supports beautiful skin by easily managing elements related to skin condition.

Smart Makeup Mirror is a digital mirror with various functions to help users make up easily and joyfully [2]. While the Smart Makeup Mirror focused on extending makeup skills, our system focuses on logging elements related to skin condition and share these data with experts for proper advice.

"Bihada Kantei" is a product which measures moisture of skin and automatically gives simple advices based on the data [3]. Using our system, users can obtain more practical advice from experts.

Conclusion and future plan

We proposed the Remote skincare advice system using life logs. We have built prototypes of Smart Skincare Dresser and Smart Skincare Charm, and performed the preliminary evaluation. Using our system, users can easily take logs of elements

related to skin condition, share data with experts and obtain practical advice from them.

We plan to perform long-term evaluation for further improvement of our system.

Acknowledgements

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Citations

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