

Proposal of a Scheduling App Utilizing Time-Perception-Reality in Analog Clocks

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Abstract—Recently, various business tools are provided as smartphone applications (apps) or Web services by the development and the advanced features of the smartphones. Typical examples are the schedule management applications and Web services for work management. On the other hand, many people prefer to write plans in the traditional paper media such as calendars or notebooks to manage their schedules. Especially among the businessmen, who have high productivity, most of them use both of digital schedule management systems and paper media. The number of these instances is quite many toady. The major reason is the usability based on “Reality (actual feeling)”. The easiness only exists in the analog tools, and it outweighs the convenience of digital tools. Because the usability that provides tactile experience is suitable for the human senses. As the instance of the books shows, numerous people prefer the books printed on papers rather than the handy digital books. The charm that analog objects have is rather outstanding in the present developing digitalization. This study especially focuses the schedule management out of the cases for digitalization, and proposes a new type of scheduling application. The application realizes the same “tactile” experience that the analog method provides, on the digital devices. In other words, it adds the analog-like expression and techniques to the digital equipment’s convenience and the excellent functionality. The specific way of realization is to provide time-perception-reality of the analog clocks. By the digital methods, the features that only the analog clocks have are replicated; the hands movements, time display of 24h/12h, and the characteristic mechanical sounds. Thus, this study proposes the clock-type scheduling application to enable the users to recognize “time-perception-reality” of the analog clocks.

Keywords-Information Media; Analog Method; Digital Representation; Information Design; Schedule Management.

I. INTRODUCTION

There are two methods in today's schedule management styles. One is a method to manage the schedules in the digital way such as using the smartphone apps or the web services. People's lifestyles are consolidated in the small boxes by the spread of the smartphones. Every kind of information is gathered there by connecting the smartphones to the Internet, and tens of thousands of apps (content) are supporting our daily lives.

Schedule management is its typical example. The user can create, organize and save the schedules by tapping the screen several times, with Google Calendar (web service),

Calendar or Reminder (smartphone apps). The other is the analog schedule management mainly among the middle age businessmen. They handwrite the daily schedules into the paper calendars or pocket planners and carry them for checking. Particularly, many people use both the schedule management by digital devices such as smartphones and the analog schedule management such as pocket planners.

Certainly, the digital schedule management has high functionality. However, there are also a lot of people thinking the functionality and productivity would be enhanced by using the analog method together. In short, only the advanced functions of the computers do not necessarily enhance the human productivity. Needless to say, the reason is the obvious difference of the features between the digital methods and the analog tools.

The remarkable uniqueness of the digital methods are high functionality and the applicability. As well as reproducing schedule information preserved in the data format, the users can alter, edit and organize the schedules by just one tapping on a button easily. Moreover, by the enhanced function of applications and web services today, the user can set an alarm automatically and improve the convenience using interlocking even with other applications. In fact, the digital method does not refer to only the field of the schedule management, and it also possesses the functions that support the user's whole lifestyle.

In contrast, the uniqueness of the analog tools is physical property. The users can touch and feel them for the use actually. Furthermore, most of the digital ways show information with a focus on each particular detail of content of the weekly or daily schedules. On the other hand, the analog ways can provide the whole information to the users at first. In the case of pocket planners or calendars, the users can hold them in hands and turn the pages actually and they can easily figure out the overall information. Above all, the physical objects can give human the “tactile reality” (sense of touch), which is never possible for a digital one.

Existence or non-existence of this tactile reality is the most significant difference between the digital methods and the analog tools. Digital books and traditional paper books are a good example to demonstrate this difference. Especially in the management of the schedule, a decided period of time is set up to each schedule. To perceive passage of time has a big influence on the schedule management. Because schedules are used not to just refer to the existence of works or needs of actions, but also to record

the time limits that show “When the user needs to do something” and “How long he or she will have to do that”. In this way, the humans can aware of the affairs. However, as far as the authors know, the schedule management tool that emphasizes time-perception-reality does not exist yet.

Therefore, this study focuses on time-perception-reality that the analog clocks have. In recent years, it is increased to check time on the digital clocks or smartphones, however, the importance of the existence of the analog clocks would not have faded. Except for the usage of the analog clock as an accessory for the design sensitivity, no other tools can give human time perception reality like the practical use of the analog clock. Time-perception-reality is shown in every respect of the analog clocks. For example, that kind of reality would be aware of by the movements of hands, the interface on the dial that designed along a circle and the mechanical sounds like “tick-tack”.

This study proposes a method that merges the analog feature - “physical reality” into the digital representations. Specifically, we reproduce the features of physical reality of analog clock on AppleWatch, the smart watch device by Apple. Based on the development, we propose a scheduling application that expresses time perception reality of the analog clocks.

II. BACKGROUND

There are mainly two methods in today’s schedule management. First, There is one traditional analog method to write down the daily plans on the paper media like pocket planners or calendars (Figure.1, Nanacollect, 2015).



Figure 1. Analog method for schedule management.

This method excels in “tactile reality” because of the use of the physical media – paper. In short, when the users write down their plans on the planners, they can certainly experience reality: “Now, I am actually understanding my schedules.” through the processes of touching the physical pieces of paper, writing the plans by pens while considering the layout design, and gazing at the completed schedules in their hands.

Besides, another advantage of paper media is the consistency. Regarding the planners, the users can recognize the past/present/future schedules at a glance by turning the

pages and they can easily grasp the idea on stream of time. In other words, it is reality that is acquired by operating and recognizing physical objects with the consistent actions.

On the other hand, the other method is the schedule management by the applications and the web services (Figure.2, SunriseCalendar, 2014). The digital method does not have “Physical Reality”, and it has superior functionality and applicability. Especially, by the spread of the smartphones, it became popular to use the handy smartphones for the schedule management instead of the previous ways on the computers. The users can also share and reuse the data easily by this way.

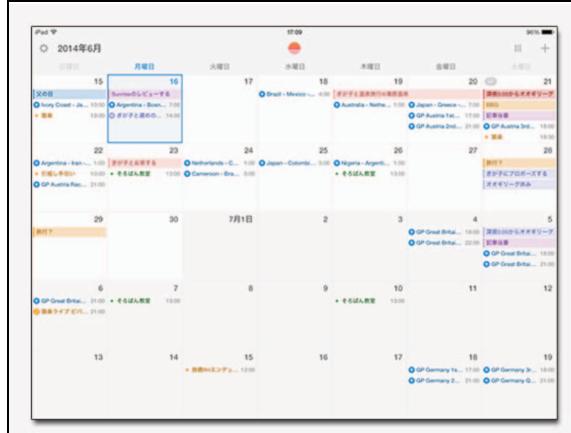


Figure 2. Digital method for schedule management.

The smartphone is one of the necessities to carry as well as the wallet, the key and the ID card. The smartphone is one of the necessities to carry as well as the wallet, the key and the ID card. Today, all of the information processing in a person’s daily life is completed in this device. The smartphones have high functionality that allows the users to add the schedules with just one press on a button and they can also edit, delete or modify the schedules by several taps. The diverse applications are installed on smartphones and by interlocking those applications, the complete support to the users’ lifestyles is possible.

However, either physical planners or the digital way with the smartphones, the expression of time-perception-reality is not enough. Those previous schedule management methods excel in the design of the plan layout, precise information, and usability of tools. However, the users cannot realize enough time-perception-reality that each schedule is located.

To sum up, the information that the precedent schedule management methods have provided is “**what** you have today (or from now on)”. It is not the direct information that indicates “**at this moment** what you have, or what you have **after this moment**”. Therefore, this study considers the schedule management method that focuses time perception reality and examines feasibility based on the analysis.

III. PURPOSE

A. What is Time-Perception-Reality?

Time-perception-reality refers to a conception of time that human recognize with their physical sensation. Of course, how one perceives passage of time depends on the individuals and environmental situations. For example, how to perceive passage of time would be definitely different; when you are doing something that you like and when you are doing something that you hate, when you are in a crowded place and when you are in solitary island in the distant ocean. This is why time-perception-reality is a quite subjective and relative idea in a sense.

However, time-perception-reality in the schedule management that this study considers does not depend on human's relative feeling. It is based on the absolute time axis and the works assigned on time axis. In other words, the method provides the objective concept of time, which works regardless of the personal factors such as preference or the environmental factors such as dynamic and static elements. This is how the concept of the absolute time works; "School starts from 9 to 14, so even if I want to go or not, and whether the classroom is quiet or noisy, I have to study exactly for 5 hours". In short, it is a method to enable the users to recognize the absolute length of time spared for a certain schedule.

This study focuses on the analog style to recognize time-perception-reality to implement the method. The analog-style recognition is important for the users to acquire time-perception-reality.

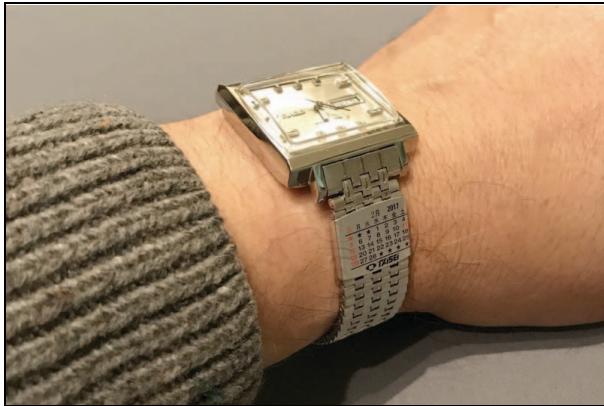


Figure 3. Image of the usage of the watchband calendar.

Figure.3 shows the image of "Watchband Calendar" that was all the rage in 1980s throughout Japan. Watchband calendar is a small aluminum plate of a calendar that is to be mounted on the band for the watch. It is an item that allows the users to check the date of the week immediately. Toady, almost everyone owns smartphones, which have high-functional watches and calendar apps.

However, this exceedingly analog item attracts people's attention again in recent years. Watchband calendar is a significant example to show the usefulness of the analog item that digital item can never substitute for. What the users

really require are not only the high-functional applications with elaborate designs, but also the simple analog tools without unnecessary parts, which can be applied immediately to achieve the users' purpose. Watchband calendar excels in operability that enables the users to check the time just with a glance and it does not require any user's actions of touching or clicking.

This surpassing physical operability is the best feature that analog tools have. This kind of operability allows the users to realize the tactile reality through the use. This study considers time-perception-reality in analog clocks based on what we have learned from the usability example of the watchband calendar.

B. Time-Perception-Reality in Analog Clocks

Figure.4 shows the mechanism for time-perception-reality that implemented by the design and the architecture of the analog clocks.

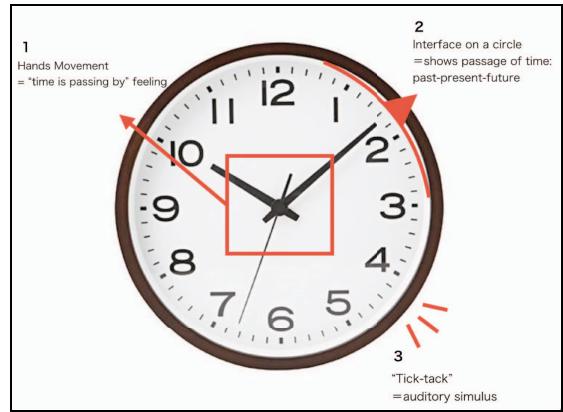


Figure 4. Design of analog clocks.

There are three factors for time-perception-reality in the analog clocks. Firstly, there is expression for seconds passing by the movements of hands when time passes. The hands of the analog clocks move at second/minute/hour intervals. They enable people to perceive the passage of time and also they visualize the dynamic state of time. Digital clocks also show the passage of time by the fluctuating numbers or flashing of the dials when time passes. However, nothing but the hands movements that moves along the circle constantly in the analog clocks can enable people to perceive time passing by precisely.

Secondly, there is the interface of the analog clocks. The interface with the numbers display of 1-12 allows people to realize the "range" of time. For example, digital clocks just express the time point of "Present" simply. When it is half past eight o'clock in the morning, the clock displays 8:30 (8:30 am), and when it is five o'clock fifteen minutes in the afternoon, the clock displays 17:15 (5:15 pm). In contrast, the interface of the analog clocks always represent not only "Present" but also the past and the future. For example, when it is 8:30, the hands would point at the position of 8 and 6. People realize that the present time is 8:30 and by the interface that indicates the numbers of 1-12 in the dial, they can intuitively recognize time of a whole day just like "how

much time has passed before 8:30 am" and "how much time is left after 8:30 pm".

Finally, people can recognize time-perception reality by the mechanical sound that only analog clocks have. Auditory sense is one of the five senses that human has. It affects human's actual recognition of reality significantly. The mechanical sounds of "tick-tack" in analog clocks prompt the auditory sense of human and gives time-perception-reality to them.

This study adopts these features of operability and time-perception-reality in the analog clocks as a motif. We propose an implement method to merge with those features and the high-functions of digital devices.

IV. PROPOSAL

A. Overview of Application

The application proposed in this study was designed for the AppleWatch, the digital watch of Apple. AppleWatch is the smart watch developed and sold by Apple Inc. in USA. This device can work as a view of iPhone by the interlocking function, and the users can use applications such as telephone, message and map. It is a highly convenient device. Of course, there are some applications originally developed for the AppleWatch and it especially excels in the fields of sport and healthcare.

The concept of the proposed application of this study is to express time-perception-reality that analog clocks have on a digital device. Specifically, we incorporate time-perception-reality into the schedule management and propose a new schedule design method. With the new schedule design method, we attempt to merge the design of analog clocks and the functionality of smart watch together.

Figure.5 shows the overview of the application.

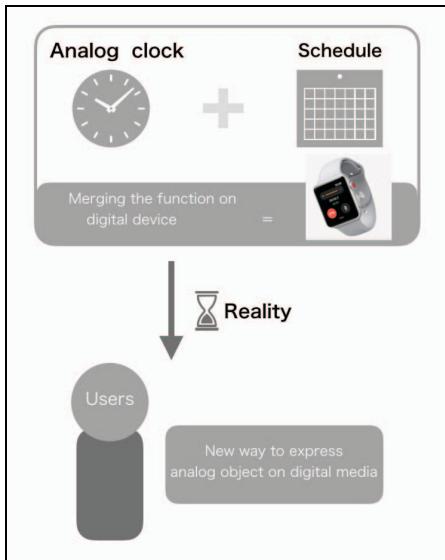


Figure 5. Overview of application.

This application is proposed as an AppleWatch app, however the operations to add/edit schedules can be

performed on the iPhone. AppleWatch works as the view of the iPhone and it displays and the outputs of the operations performed by the users. The uniqueness of this application is to express the design of the analog clocks on the media of the smart watch. It realizes the both of the analog and the digital expressions by combining the convenience and functionality of smart watches with time-perception-reality that the analog clocks have. In short, the users can acquire time-perception-reality by the analog clock style design, while utilizing the handy functions of the smart watches.

This study reproduces the design of the analog clocks to provide the users with time-perception-reality. The dial design of the analog clocks, the movements of hour/minute/second hands and the mechanical sound that only the analog clocks have, will be replicated by a digital method.

B. Proposal of Application

This application was designed in Xcode, which is the integrated development environment by Apple. This application is designed as an application for the AppleWatch. Installing the application to the AppleWatch for the use requires the iPhone for the interlocking settings. At first, Figure.6 illustrates the image of the settings and operations required on the iPhone.

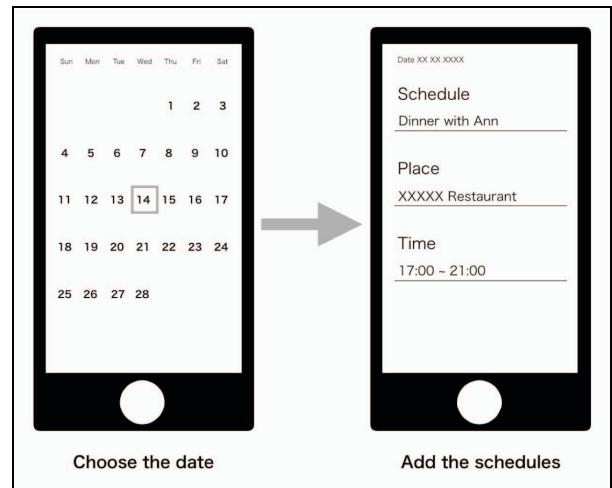


Figure 6. Operation on iPhone.

The user needs to operate the functions of add/edit/delete schedules on iPhone. The interface of the application on iPhone is designed as a calendar and it will be switched to the screen of the schedule addition when the users choose the specific date to add the plans. On the screen of the schedule addition, the users can add/edit/delete the schedules, and manage the accurate period of the schedules by specifying the start and end times of the schedule. When the application settings on iPhone is completed, the data will be reflected to the AppleWatch by the interlocking function.

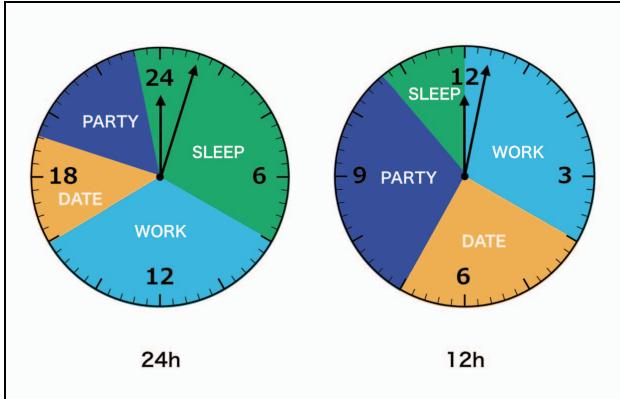


Figure 7. Switching of interfaces.

Figure.7 shows the image of interfaces switching. This application adopts the daily schedule display following a motif of the analog clocks design. And, we also implement the function that switches the interface of 24h/12h that enables the users to understand the present situation on the schedules with a more visually-detailed schedule design.

The goal of this application is to enable the users to perceive time in better way on the schedule management by the new digital method, which merges with the analog style time-perception-reality and the convenient functionality of the digital devices together. For that purpose, this application especially focused on the dial of the analog clocks and the movements of hands. In the application design, to implement time-perception-reality and enable the users to perceive time-passing before the schedules, time-perception-reality is emphasized by the following factors; the reproduction of the movements of the analog hour/minute/second hands and the mechanical “tick-tack” sounds according to the second-hand movements as time passes.

The users can feel time-perception-reality better in the schedule management by this application. The smart watch was originally designed based on a motif of the analog watch. Regarding this application, there is a secondary reference design mechanism that put the analog clock style design on the smart watch: analog→digital→analog. Thus the design method considered for this application is different from the usual ways with which the digital content are designed referring to the analog objects. In this respect, the attempt of the new application and design of “the analog” and “the digital” merger was realized.

V. CONCLUSION

A. Summary

By the development of IT, the Internet and the smartphones, people’s lifestyle has been transforming from the analog style to the digital style so far. The importance and the individuality of the analog objects have not faded in this current situation. The research and exploring of the digital application of the analog objects from a new point of view are required for the further advancement of the future digitization.

This study focused on the idea of “Reality” that analog objects have, and especially considered time-perception-reality that analog clocks have. Time-perception-reality does not just refer to the design of the appearance for the analog clocks. The interface, the mechanism, and the motions of the parts, all of them collectively provide time-perception-reality. In short, that kind of reality exists in the analog objects as a whole.

On the other hand, the digital tools lack of that kind of reality. Although digital tools excel in functionality, convenience and accuracy, the physical reality would be inevitably decreased by the digitalization and specific operations. Thereupon, this study considered a combined way that merges the digital functionality and the analog style reality together.

This method is the reproduction of the mechanism of the analog clocks on the digital device (smart watch) to apply time-perception-reality in the analog clocks to the smart watches without losing convenient functionality. Moreover, a new style of the schedule management was proposed by applying this method to today’s schedule management and emphasizing time-perception-reality.

This study devised a clock type scheduling application for iPhones and AppleWatches. In the application design, providing the users with better time-perception was practiced by the following measures: reproduction of the hands movements in the analog clocks, switching representation of the schedules on the 24h/12h interfaces and the “tick-tack” mechanical sounds that only analog clocks have.

B. Future Works

As the future works, first, the improvement and the completion of the application are required. At present stage of the study, the primary design and development are finished, however, the specific functions and the adjustment of the system to improve the usability are left as the problems to be solved. Practically this application was proposed based on a motif of the analog clocks, the method to implement time-perception-reality is not perfect yet. Other than the movements of hands, the interface and the mechanical sounds, more factors that give the users time-perception-reality in better way should be examined.

Next, we will survey the effect of the application. How much degree the users can perceive time in better way, and what kind of positive changes would occur in the users’ schedule management by the use of this application are the subjects for the evaluation. This study devised the method to apply the features of the analog objects to the digital objects. Particularly, in this respect, the continuous research is required to prove the effectiveness of the proposed method.

Finally, we will consider applicational ability of this theory in the future. This study focused on time-perception-reality of the analog objects and specifically dealt with the analog clocks, and we applied the analog physical features to the new expression technique on the digital devices. In the future, we would like to review many more analog objects and investigate the suitable expression techniques to digitalize them.

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