AN APPROACH TO THE SUPPORTING SYSTEM FOR EVENT PLANNING - TOWARD A KNOWLEDGE RECONSTRUCTION ENGINE -

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ABSTRACT

The main goal of our research is to establish "a methodology for investigation of an event" and to construct "a knowledge reconstruction system" for designing effective and attractive events. The methodology described here is to articulate gaps between event planners' intention and event visitors' mental impression from real event sites. The visitors' interactions with event objects were observed and their behavior and verbal reports (protocol data) were recorded with wearable computers and a video camera, incorporation with Dentsu Inc. Their cognitive processes were analyzed with the "retrospective report method" of protocol analysis. It is innovative to apply wearable computers and protocol analysis to real world problems to investigate human-environment interaction to grasp their cognitive processes microscopically in a real event site. In this paper, we are going to describe the methodology adopted for investigating their mental transition processes (Visitors' Mental Transition: VMT) in the real world and some examples of obtained results. From analysis of the data, we obtained a prospect that our microscopic and detailed approach is useful and effective toward actual event plannins. The concept and prototype of "knowledge reconstruction system" is described.

1. INTRODUCTION

Every year, event plannin companies hold various events. So far event plannin is conducted with implicit knowledge of experienced planners and effectiveness of events is measured only by questionnaires. In actual situations, it is said that planners cannot obtain adequate and proper knowledge for future planning from statistical data derived from questionnaires because:

- The questions are composed of only what the planners pay attention to in advance. That means they fail to obtain something unexpected.
- The planners cannot understand how and why the data was produced. It makes it difficult for the planners to utilize the knowledge.
- Even though free-answer questionnaires are adopted, at real event sites it is difficult to let the visitors answer the questions in detail.

That means planners are unable to evaluate events they design. They need to know how visitors to an event actually feel and how they behave when they are at the event booth in order to construct strategies for next event plannin. This is because knowledge cannot be utilized in real situations unless it has a context where the knowledge was produced [1]. Though quantitative data is powerful to form a conclusion, it should be accompanied by qualitative data as a reason so that planners can utilize the knowledge. Qualitative data and quantitative data should complement with each other.

In this paper, we are going to propose "a methodology to grasp visitors' mental transitions" and "a knowledge reconstruction system" through applying the framework of creativity support to actual event designing works. As its first step, an experiment was conducted at two actual events, - "Tokyo Motor Show 2001" and "World PC Expo 2001", in cooperation with Dentsu Inc. The visitors' interactions with the event objects were observed and their behavior and verbal reports (protocol data) were recorded. The concept and prototype of "knowledge reconstruction system" are described.

2. METHODOLOGY AND EXPERIMENT

As the aim of this investigation is to grasp visitors' mental transition (VMT) in a microscopic way, we adopted the methodology of "protocol analysis [2]". To obtain their actual cognitive processes at event sites, the experiment was conducted at two events: World PC Expo 2001 (WPC: 19-22, Sept., 2001) and Tokyo Motor Show 2001 (Motor Show:

Thanks to Dentsu Inc. for cooperation and funding.

26, Oct. - 7, Nov., 2001) held at Makuhari Messe in Japan. Three booths for WPC and one booth for the Motor Show were selected for the experiment in cooperation with event organizers of the booths.

2.1. Articulation of Planners' Intention

To investigate what planners intend to convey to visitors and how they designed a booth to express their intentions, we had interviews with the planners in advance. Planning papers were obtained in advance to extract messages and themes that the planners try to convey to visitors. The questions asked to the planners are basically same: "how did you design the booth to express your concepts?"

2.2. Recording Units for Collecting Protocol Data

To collect protocol data, two wearable computers were prepared [1]. Because of sponsors' intention, a normal digital video camera was adopted for collecting most of the protocol data. But this experiment definitely shows validity of real-world application of wearable computers. In fact Dentsu Inc. adopted a wearable computer for other investigation in marketing field.

9 subjects (one person for 3 sessions + one pair for 3 sessions) at WPC and 12 subjects (one person for each session) at Motor Show were employed. Subjects are asked to look around designated booth(s). After visiting the booth, a detailed interview was conducted. Its procedure is:

1. *Retrospective reports with visual aid*: The subjects were asked to report "what you look at", "what you think about it" and "what you do" along with VTR they recorded as a memory aid. This interview is called "VA (Visual Aid) Interview".

2. *Questions about the subjects' impression on the event objects*: The questions were made based on the interviews with the planners and the planning papers. This is to investigate how the planners' intention and the visitors' impression match or mismatch with each other.

3. *Keyword questionnaires*: A keyword list was made also based on the interviews with the planners and the planning papers. This is to investigate what keywords the planners presented were impressive and which keywords the subjects could remember.

[1] In cooperation with MIT Media Lab and Intelligent Cooperative Systems Laboratory at Research Center for Advanced Science and Technology, the University of Tokyo.

3. RESULTS AND DISCUSSION

Though there are a lot of findings that surprised the planners, in this paper we are going to show two examples of a lot of unexpected findings that are beyond the planners' expectation at Motor Show. These findings devote to create new knowledge, which is "knowledge reconstruction".

3.1. Effect of the Other Visitors

The other visitors can provide "a context" that raises degree of satisfaction of visitor. Following report was obtained:

A companion took a picture with a family. Both of the companion and the child smiled. My (= the subject's) children also like cars. They would be delighted if I took them here. That is a good idea.

This observed data was reported to one of the planners and he hit upon a new strategy:

By inviting families that are customers of the company, the other visitors will feel in a way mentioned above. Moreover, the invited family will also feel better because they feel "they are invited as special guests" and this family can enjoy being a customer of the company, which will be great benefit to the company, too.

This is a good example of "knowledge reconstruction". We call it "reconstruction" because implicitly they might know:

- A visitor is affected by another visitor at an event site.
- Customers are delighted if they are invited as special guests.
- If customers like the company, it is beneficial to the company.

Providing a real context connects these pieces of information. That means knowledge with "its real context" obtained through this analysis can support event-planning if it is properly reported to planners.

3.2. Gap about the Stage between Planners and Visitors

Normally event planners agree that length of a main stage show should be within ten minutes. Although length of visitors' staying at a booth is usually investigated with quantitative analyses, the length of staying at a stage is left unchecked. It is unchecked at which scene of a stage visitors leave, either. That means strategies of designing stages does not exist explicitly[2]. So it is worthwhile investigating the length of visitors' staying and at which scene they leave there. An example of analysis of a stage is described. One of the stages was composed of six scenes with technical information and

[2] Perhaps planners might have strategies implicitly.

images of benefit. This stage lasted for twelve minutes and started every ten minutes.

The planners' hypotheses about the stage are:

- Twelve-minute stage is short enough to let visitors watch whole of it.
- The technical parts of the stage are not so attractive that it is difficult to keep visitors watch these parts.

But from the analysis, such data and tendency as follows were obtained:

- Average length of stay is about 3.6 min.
- The visitors leave or get tired of the stage when the image of benefits is started.

Though there was one subject who watched whole of the stage, he reported that he could not understand what the scenes with comfortable images tried to convey. There also exists a gap between the planners' knowledge and actual situation. This phenomenon also must be reported.

These facts might not sound surprising very much, but these pieces of information have not been reported or developed to "useful knowledge" at real event plannin sites so far because implicit information lacks an important element for utilization, i.e., "a real context" [1]. Our methodology of microscopic analysis can definitely provide the planners with "knowledge with its real context". Based on these facts and analysis, we are going to propose a supporting system that provides "knowledge with a real context" with planners. In the next section, the system image is described.

4. TOWARD A KNOWLEDGE RECONSTRUCTION SYSTEM

4.1. Concept of the System

Though importance of knowledge has been claimed since middle of the 1980s, main concern of business theory has been how to obtain and accumulate established knowledge. Little research has been conducted on how innovative knowledge can be created. Nonaka [3] has claimed that there are four modes of knowledge transition: Socialization, Externalization, Combination and Internalization. He also claimed that knowledge should be regarded as spiral-up cyclic process. Though a lot of companies have attempted to apply this theory to their actual works, it has not been successful. Nonaka's theory was proposed as a theory for "transition of knowledge mode", not for "manipulation of knowledge mode".

As our investigation externalized a lot of knowledge successfully, we are going to propose a supporting system to utilize the knowledge. Our approach supports each mode of Nonaka's theory in a following way. In a later section we are going to describe what the system is like in more detail.

Externalization This mode is supported by the methodology we proposed in the former sections. In addition, it is necessary for a user to have " a browser" to discover unexpected knowledge that was unobtainable or discarded by traditional methods. We are going to propose an interactive browser that promotes a user's reflective thinking.

Combination From the data obtained through the analysis, this mode is supported by "exhaustive search" and "interaction with spatial representation". Based on the conclusion of Hori [4] and Yamamoto et al. [5], spatial representation is adopted to show what were focused by both the visitors and the planners and relationships among the focused objects.

Internalization It is expected that this system promote the user's understanding

Socialization For example, "pursuasion of clients" is expected by using this system.

We adopt spatial representation to present data to a planner. Hori [4] conducted the experiment on effects of spatial representation in a conceptual design. His system named AA1 presents words that represents concepts the user vaguely conceives, on a two-dimensional space, the user can change their locations of the words on the space. This action allows the user to clarify gradually his/her concept and such phenomenon was observed as the user came to generate new concept by looking at a blank area on the space. This result can be used for our aim.

Our system aims to "be used for a real world problem". Knowledge cannot be separated from actual contexts to utilize the knowledge, i.e., knowledge management. That means that it is necessary to preserve knowledge together with "its real context". Event planners need to know how knowledge was produced. It is necessary for planners to obtain and understand knowledge, to integrate and create innovative knowledge, and to apply knowledge to actual event-planning. And from the event, new knowledge can be extracted again. This "loop" is what we call "knowledge reconstruction". Knowledge must be dynamically integrated, innovated and applied to real world. We are going to construct a system for supporting to promote this cyclic process. In following sections, expected interaction and system image are described.

4.2. Expected Interaction with the System

Snap shots of the system are shown in Figure 1 and 2. The system is composed of two components: "ChronoSpace" and "ContextMap".

Following scenario is an expected interaction with the system. At the current state, some of the expected functions

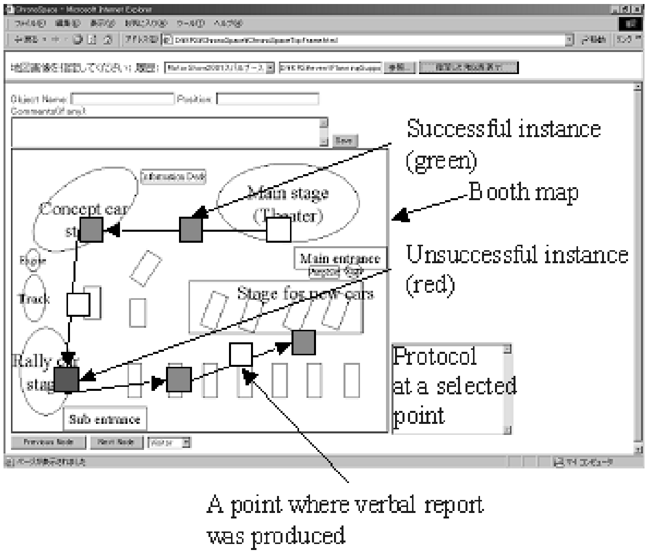

Figure 1: A Snap Shot of the System "ChronoSpace"

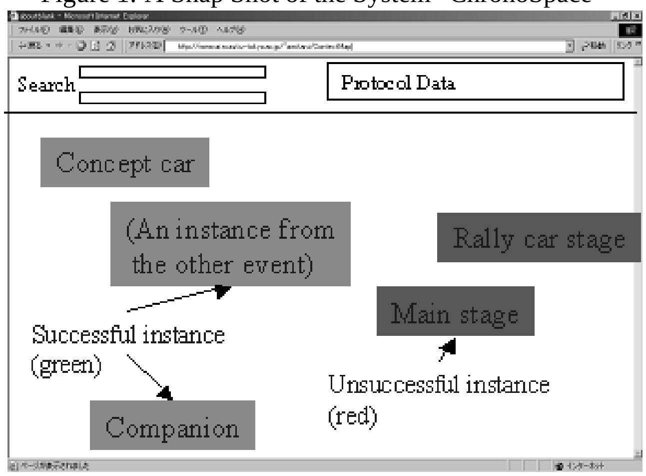

Figure 2: A Snap Shot of the System "ContextMap"

are implemented. We are not going to describe each function because there is not enough space.

Preparation phase
During or after an arrangement plan of a booth, the booth map is loaded into ChronoSpace. The planner (or other staffs) names each object on the map along with planning papers. As the names of objects are used to analyze protocol data, the names should be consistent. So it is a good idea to extract the names from planning papers. And it is also possible to attach comments to the objects. For example, a reason why an object is designed as it is can be used later as a cue to see if the object worked along with the planners' intention or not.

After investigation
Verbal reports are encoded into a text along with "what he/she looked", "how he/she felt/thought" and "what he/she did". The names of what the subjects looked at should be correspondent to the names used in the "Preparation Phase" because this correspondence is used for automatic generation of "visitors' flow" on the map in ChronoSpace. As protocol data is chronological, it is possible to draw a line of visitors' flow automatically if the names of the objects are correspondent. Marks appear at points where verbal reports were produced (Fig.1). Of course there should be unpredictable objects (other visitors, etc.), in that case marks for unpredicted objects appear between marks of predicted objects.

Investigation by planner
From this stage, it is the planner who uses the system. The former two steps, it is possible for anyone to do because the steps are composed of a set of procedures. The planner checks the marks on the map one by one and reads protocol data to find something "unexpected" for the planner. Though this time the authors reported unexpected events to the planners, ChronoSpace allows the planners to find such events by themselves. If the planner finds something interesting for him/her, he/she can attach such tags as "success" and "failure". In addition, the planner can attach his/her own comment to the data. The protocol data the planner attaches tags and/or comment can be regarded as what the planner focuses on. That means these data are interesting and/or unexpected for the planner. These are worthwhile preserving.

Presentation to clients
Before an event, it is necessary for planners to present to clients how they are going to organize the event and how they are going to implement a booth. In ContextMap, there appear objects the planner focused on. The objects the planner attached "success" tags are colored in green and those of "failure" tags in red. They are arranged along with similarities among protocol data. That is, objects arranged closely with each other can cause same visitors' mental transition. By showing this space to clients, it is possible to promote "clients' understanding" and to persuade them. For example:

- *There is a method like this and it caused this type of impression. It is applicable to the event this time.*
- *That type of method once caused a bad impression like this. It is not recommendable way.*
- *In the past, these methods have been used. This time, we are going to adopt an innovative method because this is innovative and this type of impression can be expected, judging from this space.*

ChronoSpace and ContextMap are linked. By clicking an object on ContextMap the planner can return to the correspondent data on ChronoSpace. Then ChronoSpace can offer detailed background of the effectiveness of the selected method. That is, ChronoSpace can provide "a context" how the method was used and what kind of impression was caused. It also promotes understanding and makes the explanation more persuasive. It promotes not only clients' understanding, but also the planners' understanding.

Planning a new event

ContextMap and ChronoSpace are also useful in planning phase. By browsing the past instances worth while paying attention and "blanks" on the space:

- How can I cause a certain impression to visitors?
- What methods have been already done?
- (By looking at blank) What is a new method?

5. CONCLUSION

In this paper, we proposed a road map toward "a knowledge reconstruction system". As its first step, microscopic investigation was conducted to understand visitors' mental transitions. The most important point of our approach is that the theory and the methods used only in laboratory experiment are applied to a real world problem, which is event-planning.

Through protocol analysis, following pieces of knowledge were found with "their real context" that have not been obtainable from traditional statistical investigation.

- Effect of the other visitors (in our result, for example, "effect of a family")
- Effect and difference of understanding of congestion between designers and visitors

These pieces of knowledge with their real contexts are useful to establish new strategies, although the statistic data lacks them hence they are discarded. That is why we propose "knowledge reconstruction system" that provides with planners "knowledge with its real context".

A knowledge reconstruction system is currently under construction. Our next plans are:

- To establish a prototype of the system
- To apply this system to a real event-planning site
- To investigate how a way of knowledge management changes

6. ACKNOWLEDGEMENT

The authors gratefully acknowledge the generous assistance of Ms. Shoji, Mr. Shibata and Mr. Kanazaki for experiments and discussions. With thanks to Ms. Ueoka in RCAST and Mr. Clarkson at MIT Media Lab for wearable computers.

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