5-3 Studies on Community Knowledge Creation Support in Knowledge Network Society

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In this project, we address the research and development of information and communication technology that facilitate knowledge creation process of networked communities through an interdisciplinary approach integrating social psychology, cognitive psychology, and information and communication engineering. The major results obtained from this project so far is a proposal of an interactive broadcasting system called the Public Opinion Channel (POC) for supporting community knowledge creation and a foundation for a novel interdisciplinary research concerning social intelligence design. In this article, we will overview the framework of POC and describe the major issues underlying POC. We will also discuss issues involved in generalizing our activities into a discipline that might be called interactive informatics.

Keywords
knowledge management, community, knowledge media, network society, social intelligence

1 Introduction

Industrial, business, and community activities in the network age center around information networks that allow people to create, edit, apply, share, and convey knowledge across a diverse range of fields.

Network communities, a group of people with weak ties, play a critical role in the creation and conveyance of knowledge. Typical network communities include, for example, communities of people created through a shared interest (community of interest); communities where people are connected through a common practice (community of practice); communities created by the shared physical environment; and local communities where the relationships between people are strengthened through information networks.

We are interested in understanding and supporting a "knowledge community" whose primary goal is the creation and dissemination of knowledge. The academic association is a typical example of such a community. A collection of people in organizations such as universities, research institutions, and enterprises may be considered as a community resulting from a shared physical space and the intranet. In communities of volunteers and communities of interest, practical knowledge of great value can be created on specific topics.

The goal of the Synsophy Project, launched in April 1998 (Nishida project in Basic Research 21 for Breakthroughs in Infocommunications, Ministry of Public Management, Home Affairs, Posts and Telecommunications), is to establish a methodology for designing a software system that helps us

understand and sustain the knowledge creation process in communities.

In principle, the knowledge creation process in a community can be modeled as a synergistic process linking the knowledge chains created by community members (knowledge network) with new community members (human network) through the forging of relationships, as shown in Fig. 1.

In order to understand and model the knowledge creation process within a community, we need to establish an interdisciplinary project where the designs of supporting systems are closely linked towards the development of the info-communications technology that fosters knowledge creation. Social intelligence design is a research area aiming at developing an info-communication technology that can extend the social intelligence which emerges from various social frameworks. We would like to establish social intelligence design as a branch of community informatics by integrating social psychology, cognitive psychology, and info-communications technology.

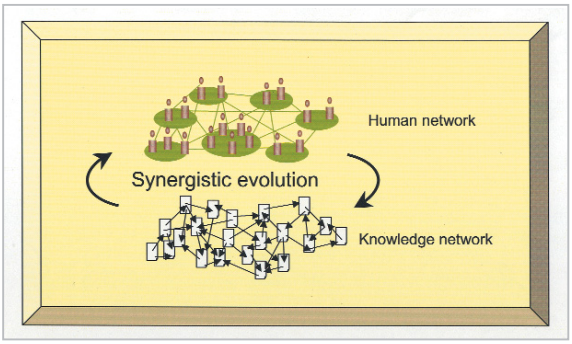

Fig.1 *Definition of knowledge creation community as a place of synergetic interaction between a human network and a knowledge network.*

2 Public Opinion Channel (POC)

Public Opinion Channel (POC) is a system that our research group has proposed as a novel interactive broadcasting medium for supporting the synergistic evolution of human networks and knowledge networks by exposing community members to the interests and knowledge of the members of the knowledge networks. POC summarizes messages originated by community members and then provides a summary of them to the community [Nishida 1999, Nishida 2000, Azechi 2001]. Members of human networks can also receive feedback from the community that created the knowledge.

As shown in Fig. 2, POC provides an information distribution cycle consisting of the following: (1) presentation of topics and collection of responses; (2) information transmission from community members; (3) collection and summarization of the transmitted information into programs with narrative story lines; and (4) reaction of community members toward the broadcast. The stories are accumulated in the POC memory, which grows as it absorbs responses from community members. In other words, POC works as an incubator and distributor of stories shared within a community.

α-POC is a prototype of POC system that provides the user with bulletin boards on specific themes and community member chat rooms, both available on the World Wide Web. The system produces message guide programs based on bulletin boards and broadcasts programs when relevant topics have appeared during a chat. α-POC comprises an information-collecting module, an information-summarizing module, and a program-broadcasting module. The information-collecting module gathers information sent by community members through the Bulletin Board System (BBS). The information-summarizing module summarizes diverse text-based information, organizing it into major and minor categories. The program-broadcasting module produces program scripts by reworking existing scripts prepared in advance. Narration is provided by a text-to-speach system that speaks the program scripts. A program script specifies a sequence of stereotypical utterances on specific topics. It consists of a topic category and a topic script. The topic category is a unit of topics constituting a program script. The topic script is the text applied to each topic catego-

ry. A topic script is inserted in each topic category. The topic script corresponding to each topic category is selected from the script database.

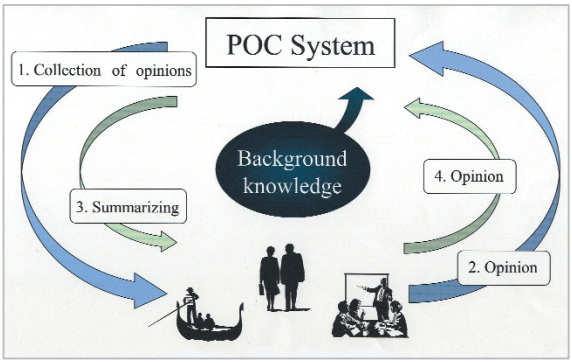

Fig.2 *Public Opinion Channel (POC): Community members' opinions are collected, edited, and returned to the community as feedback.*

POC is expected to contribute to the knowledge creation community as follows:

1) Community formation and support

POC broadcasting is useful to identify interests and policies existing in the community, contributing to the creation of new human relations. Since members are constantly updated on community affairs, they are aware of the sort of people in the community and what they are interested in. This enhances community awareness and helps community members understand each other better. The human network and knowledge network are thus expected to develop by interaction.

2) Support of large-scale discussion

POC is expected to be a novel communication medium that facilitates large-scale discussion. We believe that by enabling people to use POC to generate interest, pose questions, present experiences, and offer information on a wide range of topics, a steady accumulation of daily ideas and experience will create a solid medium for high quality discussions to take place. Minor issues should be aired equally with major issues, in order to foster fair discussion. POC will record discussions so that people can develop them further at a later date. POC may be useful in a variety of knowledge creation communities. The following are typical scenarios of POC applications:

(Example 1: Application to learning communities)

A learning community is a group of people gathered to acquire knowledge. Similar to a school, a learning community comprises teachers and students. POC will facilitate distributing and sharing a massive number of messages, so that not only students' interests and questions but also teachers' intentions underlying the lecture will become widely exchanged. Through this process, teachers can learn what students think, and knowledge will be shared among teachers and students. Each learning community will be able to create its own curriculum by compiling students' interests and teachers' answers to develop a student's voluntary course of study. The accumulated messages will provide a good foundation with which a new member can understand the background of the community, too.

(Example 2: Application to consumer communities)

A consumer community is a collection of consumers involved in a particular service or product. The consumer community is an important place where consumers can learn about a service or product by asking questions of service providers and manufacturers. At the same time, service providers and manufacturers can also learn what consumers need and keep a close watch on its consumer community. POC will open up the channels of communication and significantly promote business. Thus, the leadership of well-informed consumers is enhanced, and innovative services and products may be explored.

(Example 3: Digital democracy)

As modern society grows, it becomes more and more difficult for ancient direct democratic systems to survive, and representative democracy (weak or thin democracy) becomes popular. Although thin democracy is regarded as an effective system in terms of accountability, it is not likely that thin democracy can bring about an in-depth dialogue among society members, which often results in a lack of participation in policy making. As a result, the incidence of political apathy grows. POC will help us implement a strong

democracy in which all society members participate, for fairness and expressive power will be increased through POC 's media involvement.

3 Social intelligence design

A comprehensive approach coupled with sociology, social psychology, cognitive psychology, and engineering is necessary for making POC effective as a tool for use in extending social intelligence shared by community members in a social framework. We call this approach "social intelligence design." We believe that social intelligence design is an effective research area in community informatics due to its capacity to foster understanding among the people involved in social intelligence.

In the rest of this section, we will describe major results obtained by the Synsophy Project.

3.1 A model of network communities

In order to understand the network community, we have analyzed the fundamental factors that create a human community [Azechi 2000a]. Our conclusion is twofold. Firstly, the community capable of promoting knowledge creation must be a "dry," or objective community. Secondly, it must respect minority opinions.

We will discuss desirable features of community support tools to meet the above requirements in terms of social psychology.

3.1.1 Historical review and defining communities

We define community as a collection of people featuring the following three characteristics:

1) Members share a common goal;
2) It's easy to join and leave; and
3) There is no hierarchy.

The classic definition of community encompasses almost all societal activities among people, including (1) local community; (2) a central place for everyday life and living; and (3) improved human relations with a priority on organic relationships and emotional fusion in the group. Our characterization of knowledge creation communities differs from classic ones in that they are (1) less local; (2) have a more casual emotional relationship among members; and (3) the members' goals are limited to knowledge creation.

3.1.2 Adverse community conditions

There are several adverse community conditions that can negatively impact the realization of a community supporting knowledge creation. The following are examples of various social phenomena related to such communities.

1) Colony: A colony is a community with a fixed membership and an established hierarchy. Colonies place a high value on the status quo, resisting change and making it difficult for members to have free discussions.
2) Group think: The collective behavior of people has certain undesirable aspects. For example, poor information exchange and sharing among members will often result in less effective group decisions than those made by a single individual.
3) "Flaming": Flaming is an effect of persistent negative attacks on individuals during discussion. Flaming hinders useful information exchange.

3.1.3 Communities that promote knowledge creation

Social phenomena resulting from adverse community conditions erupt when placing excessive priority on "wet" or subjective information (see 3.2). A "dry" or objective community is therefore more suitable for promoting knowledge creation.

In addition, minority opinions must be respected. Knowledge creation requires a process for understanding information and acquiring knowledge through interaction (schema conversion). Minority opinions will accelerate schema conversion when they are presented to the majority of members. Adverse community conditions would stifle minority opinions, blocking information exchange and sharing among community

members.

3.1.4 Functions needed in POC

Considering the above aspects, the following parameters should be established for encouraging the POC-mediated community to create knowledge.

1) "Dry" or objective community: Filter "wet" or subjective information (see 3.2).
2) Presentation of minority opinions: Pay special attention to the valuable opinions launched by small groups in the community by selecting them from circulating information. At the same time, guard against nonsense information and the exploitation of power by minority groups.

3.2 A model of communications in network communities

We have built a "humidity" information model[Azechi 2000b] that establishes that the main cause of flaming, which prevents free and creative discussions in a network community, involves criticism of the personality of the speaker (i.e., interaction with "wet" or subjective information). We claim that constructive discussions take place in a "dry" or objective community where interaction is restricted to "dry" or objective information. Communication tools are needed for implementing and fostering such interaction.

3.2.1 Premise of discussion

Critical attacking (negative campaign) is a factor that harms free discussions and knowledge creation in the network community. In previous studies, the high degree of anonymity in CMC was believed to contribute to critical attacks. The current research, however, attributes the cause to references to the speaker's personality. Therefore, creating a situation that restricts reference to individual personalities and requires speakers to concentrate on the contents of discussions eliminates critical attacks and promotes free creative discussions.

3.2.2 Information humidity model

In the information humidity model (Fig. 3), the information exchanged during communication is divided into the personal attributes of the speaker (subjective information) and the factual contents of the discussion (objective information). The subjective information is further divided into three categories according to the social relationship between the message sender and the receiver.

These categories mirror the classification of social information processing. Subjective information is secondary information. Only objective information is necessary for rational information processing.

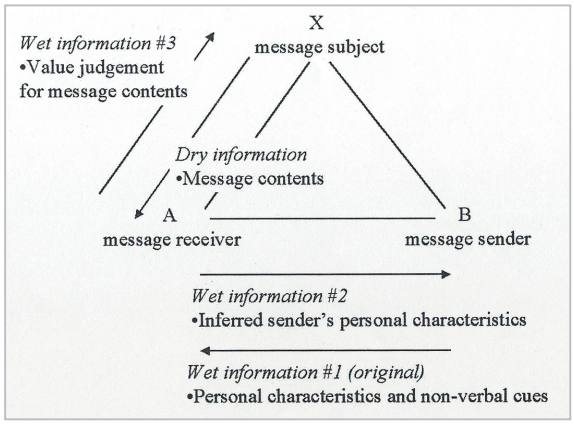

Fig.3 Information humidity model

3.2.3 Dry community

A community restricted to the exchange of objective information is referred to as a "dry community." The dry community model is considered an ideal community in which free and creative discussions are generated.

Interaction between humans under natural conditions always includes subjective information. In order to build a dry community, specific communication-supporting tools are required. In this paper, we offer POC as such a tool to establish a dry community.

3.2.4 Functions required for POC

POC needs to filter subjective information to establish a dry community. We recommend the following two methods:

1) the "dictionary method" for filtering information by referring to a list that defines words used in subjective interchanges; and
2) the "detection method" for filtering information by detecting behavior specific to the exchange of subjective information.

Collection of specific examples and data is

necessary to use as the basis of these methods before implementation.

3.2.5 Future work

In order to conduct field tests for the psychological study of the information humidity model, a simulation experiment has been planned. A survey will be conducted to collect examples of subjective information that should be filtered in CMC scenes.

3.3 Social psychological model of the dynamics of opinions in network communities

As part of our study, we have discussed the influence of minority opinions [Matsumura 2000]. The nature of the consensus formation process and concept proliferation process in the network community will be made clear by investigating how minority opinions affect such processes.

3.3.1 Discussion on the minority influence

We compare the minority influence in small groups to that in the network community. In a small group, minority opinions are respected and have the power to influence the opinions of the majority. Minorities must initially establish their presence to the majority in order to be considered and allow their subsequent opinions to be convincing enough to exert influence upon the majority. This will increase the power of the minority. It is known that minority opinions may activate the divergent thoughts of majority, thus making them important for knowledge creation in a community. Since minority opinions are likely to be lost in small groups or communities, minority sectors should be encouraged by those who care.

3.3.2 Circulation of minority opinions in the network community

We have considered how to present minority opinions to the network community based on the above discussion. We have also investigated what functions will be needed for POC to summarize information when circulating useful minority opinions inside the network community.

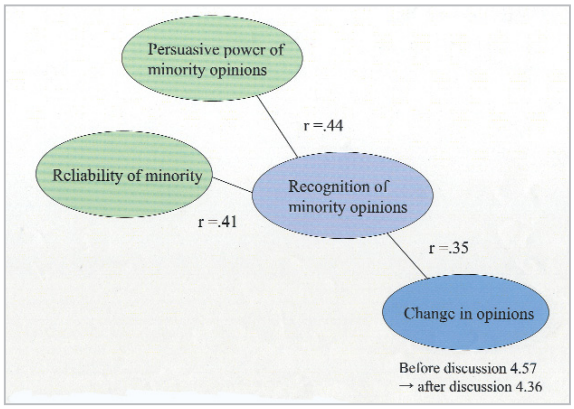

Fig.4 *Model of the minority influence process*

If minority opinions are introduced to the network community, information distribution is facilitated and the sharing of information among community members is promoted. Information sharing among community members plays a key role in analyzing the consensus formation process and concept proliferation process in the community. The investigation of the influence exerted by minority opinions during consensus formation and the analysis of the proliferation process of minority opinions in the community are very interesting subjects in social psychology. They are also useful for investigating the effectiveness of the Internet as an information-distributing tool as Internet use becomes more widespread in society.

3.3.3 Future work

The research results obtained in the POC community will clarify the patterns of human behavior in the network community and lead to analysis of the consensus formation and concept proliferation processes. Consensus formation in the network community is influenced by opinion distribution. Information sharing among members is necessary for consensus formation. In POC, minority opinions are broadcast to encourage information sharing among viewers inside the POC community. What is important here is the discussion about the information-sharing process and its effects. When a group consensus is formed in the network community, it is very important to know how to share information among community members. Also of interest is the role

of information sharing in consensus formation. By analyzing the consensus formation process in the network community, the influence of minority opinions and the effects of information sharing will be clarified.

3.4 Cognitive psychological research on the knowledge creation process using network tools

We have obtained the following results through cognitive psychological research on the knowledge creation process using network tools:

(1) We have clarified the factors that facilitate creative use of original expertise and external information;
(2) We have proposed a model considering users' interactive behavior in the knowledge creation process utilizing network tools [Fujihara 2000].

These insights will help establish evaluation methods for network tools represented by POC.

3.4.1 Analysis of factors that facilitate creative knowledge activity

In order to clarify the factors that facilitate the creative knowledge activity in which original expertise is utilized as much as possible along with information provided from the outside, the behavior of classifying information has been analyzed from the viewpoint of cognitive psychology. As a result, it has been found that humans are basically cognitively rigid (cognitive parsimony) and are not willing to utilize knowledge in a flexible way. We consider that the following two conditions are critical to promote dynamic interactions between original expertise and external information:

(1) Leave enough time for information processing; and
(2) Identify the relationship between original expertise and external information.

3.4.2 Cognitive psychological study of the knowledge creation process using network tools

In order to study how humans use network tools, we have conducted a cognitive psychological survey on information retrieval behavior using the World Wide Web under experimental conditions simulating real scenes (fields). It has been found that users have difficulty in determining the keywords needed for an information search in its early stages. They find appropriate keywords as the search process continues making the search process increasingly easy for users (Fig.5). Analysis/evaluation methods for network tools have not been established. The methodology employed in this research is a novel method.

3.4.3 Implications and future research

We consider that the research described thus far is meaningful in that it has clarified several points. Firstly, humans creatively utilize knowledge if the required conditions are all provided. Secondly, this is a highly interactive process that must be given particular attention when using network communication tools.

Humans are not creatures that only mediate in silence. They are unlikely to find solutions by merely examining a given problem. Rather, humans go through trial and error before reaching a final solution. By tackling problems, they improve their approach and come closer to the best solution.

We will study whether the users can use POC in an interactive manner and whether such interactions can facilitate creative knowledge activity in terms of cognitive psychology. We will also establish a universal network tool evaluation method by utilizing the research results obtained so far.

3.5 Information systems supporting knowledge creation in communities

Focusing on talks among community members - which are the basis of mutual understanding and knowledge creation in the community - we have proposed a knowledge creation supporting system using a conversational agent. We have developed the following two techniques for its implementation [Kubota 2000]:

1) Automatic conversation-generating technology for talks between multiple agents and a

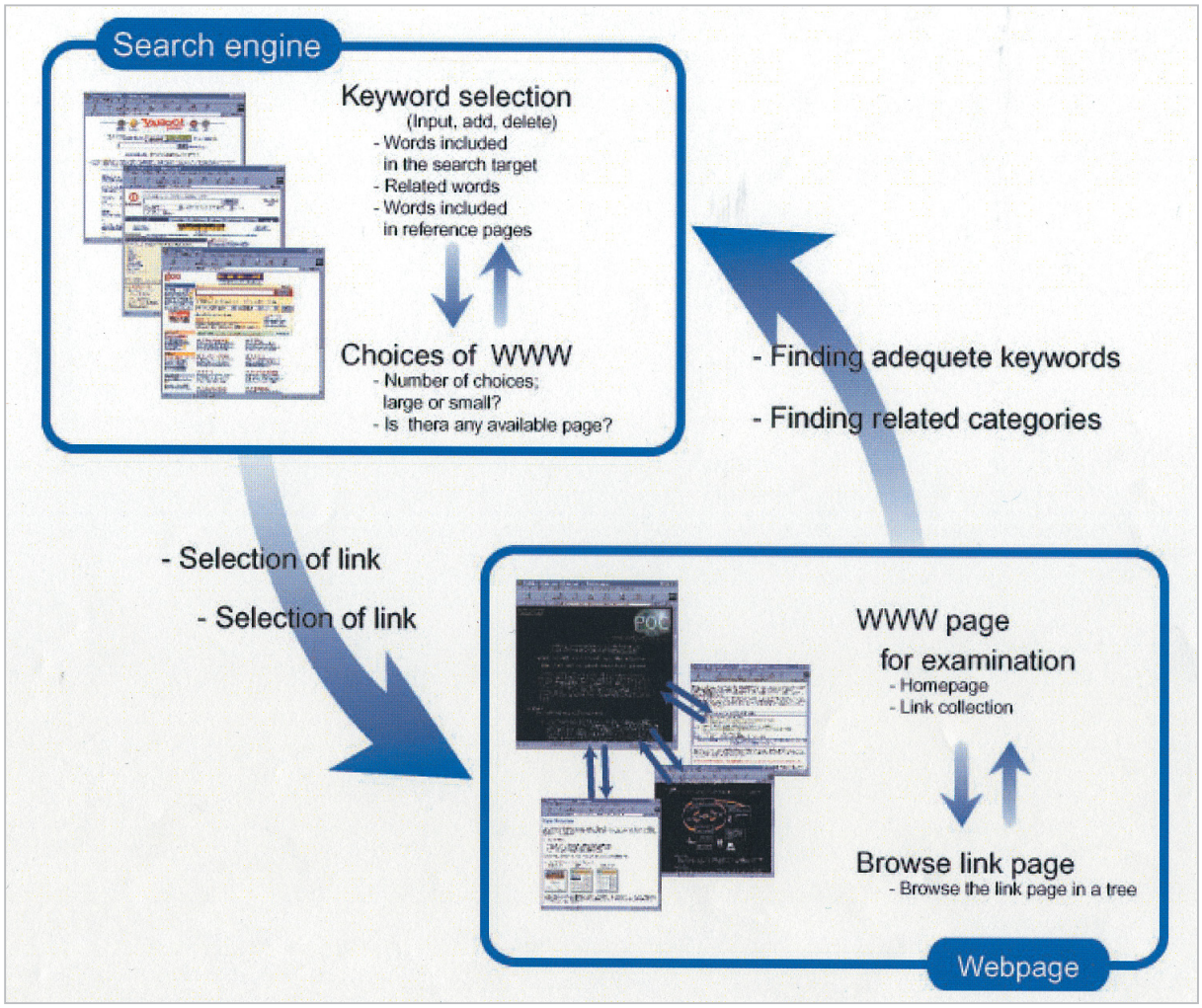

Fig.5 *Recognition model for information search on the World Wide Web*

user.

2) A memory organization technique that accumulates the information provided by users through interaction with the agents in an intelligent form that can be reused. We plan to conduct field tests of the knowledge creation supporting technology by employing conversational agents, utilizing a developed system called EgoChat.

3.5.1 Proposal of knowledge creation supporting systems using conversational agents

We have studied the design of an information system that supports knowledge creation in the network community and how to use the conversational agents. Conversation, reading, and writing are easy, daily communication tools working as the basis of information dissemination and knowledge acquisition. While text-based expressions such as newspapers provide detailed information working as knowledge media, oral expressions such as news programs are casual tools for providing a broad overview of information. Since we think that a knowledge-distributing system that relies on conversation will facilitate knowledge creation in the network community, we have proposed a supporting system using conversational agents.

We implement a special kind of conversational agent called “virtualized egos” that represent the community members. The knowledge that has been accumulated in the community includes much information about the social background of the community and individual data on community members. In our research, the information included in individual mail and related to one’s interest is accu-

mulated as the knowledge of the virtualized ego of each community member. Such information is disseminated in the community through voice chats. The virtualized ego is capable of autonomous conversation with humans beyond time and space limitations. Community members may talk to the virtualized ego of another member at any time and receive or send knowledge through voice chats.

3.5.2 EgoChat system

We have developed EgoChat as a prototype of the knowledge creation supporting system using a virtualized ego [Kubota 2000]. Figure 6 demonstrates its schematic structure. The technologies such as input of topic by user; conversation generation; and automatic conversation-generating technology adapted to the knowledge acquisition process are the results of unique, innovative research on conversation generation using multiple virtualized agents. Besides, we have proposed a knowledge representation, including e-mail corpus, as the method of expressing information such as off-line information provided by mailing lists, etc., and knowledge provided by on-line voice chats in a reusable form. This method has been installed in the developed system.

3.5.3 Future work

We plan to conduct field tests of the community knowledge creation supporting system using conversational agents (EgoChat) in the near future. Such a field trial will help us further investigate a technology for the automatic generation of creative conversation.

3.6 Supporting systems for information customization (Telme)

We have proposed a method and system, Telme [Sumi 2000], that bridges gaps in background information in real-time conversations by installing computers between the speaker and the listener.

In evaluation experiments, we have con-

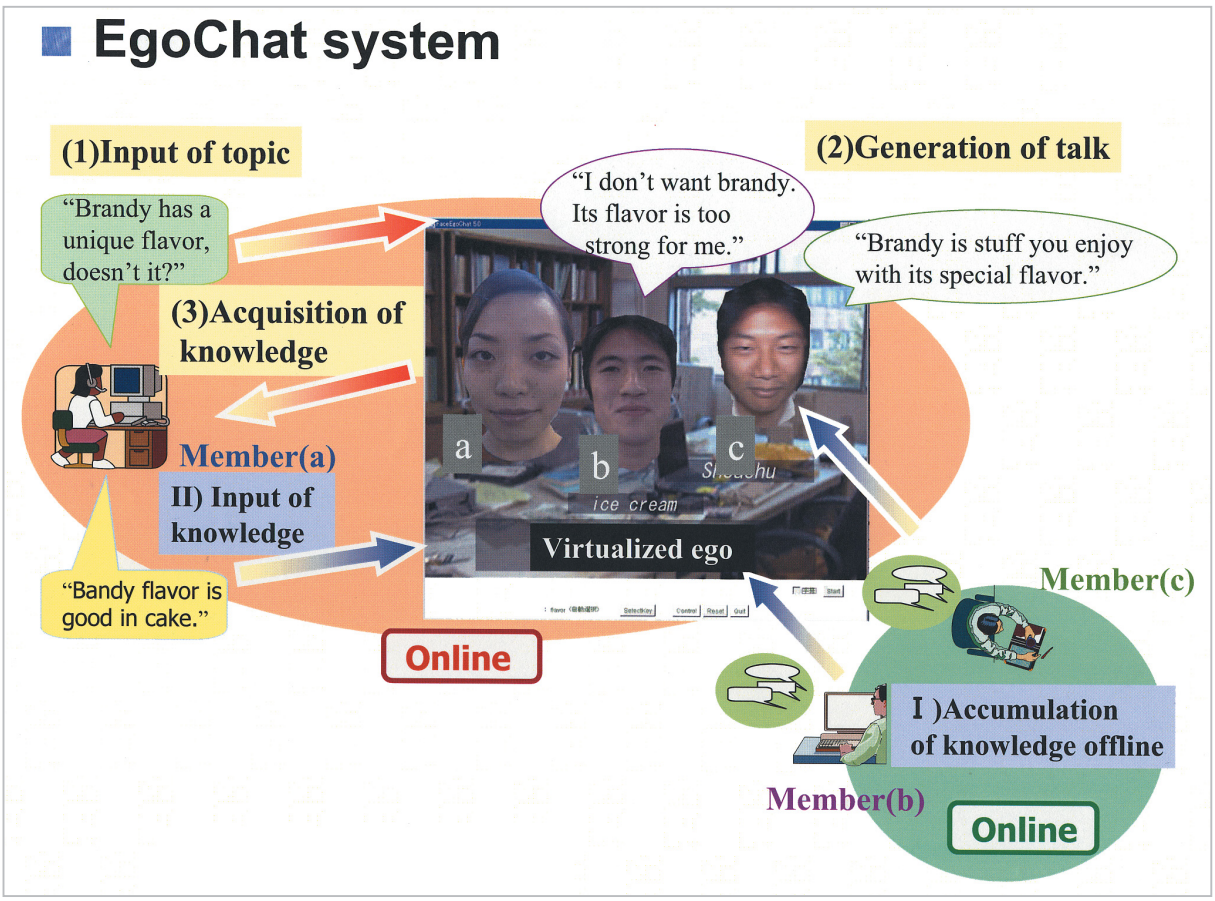

Fig.6 EgoChat system

firmed that the proposed system is capable of compensating for gaps in context and individual knowledge. It may also be used for a variety of applications in other fields.

3.6.1 Objective

We have proposed a method and system that bridges gaps in background information in real-time conversations by installing computers between the speaker and the listener.

3.6.2 Method

The basic idea is to estimate the listener's knowledge level based on the questions he or she asks and their operation history, such as what data he or she saved. From this, we then add information that may be helpful to the listener and display it on screen. The estimated knowledge level is found by referring to the individual knowledge space that has been personalized by a plurality of concept spaces created by specialists in each field. This knowledge space consists of a collection of keywords related to each other. Through interaction with computers, the relevancy and estimation of the user's knowledge level are gradually optimized.

Users talk via computers, while the database server provides information at the request of the users. The speaker's utterance is displayed as text on the screen along with added complementary information. The major part of such complementary information includes explanations of words that have appeared in the talk (text and visual image). The other parts are, for example, the user's personal knowledge base (knowledge conceptual space) and conceptual space representing knowledge about the topic (topic conceptual space). Displayed on the screen is the main window where the talk of the speaker is expressed by text; a window for the conceptual knowledge space; a window for the conceptual topic window; and an assist window where the explanations of words are displayed.

3.6.3 Discussion

In an evaluated experiment, we are convinced that the proposed system is capable of compensating for gaps in context and individual knowledge. Almost all users enjoyed the ease of using prepared interfaces for asking questions, clicking on useful information, and deleting unnecessary information. Because the system customizes information for each individual, the information can be utilized in a natural manner.

In terms of the system's response, a few users were not fully satisfied. This problem was caused by a delay in displaying the conceptual space window. This problem might be solved by displaying the conceptual space window in the background.

We expect that the developed system will be used in a variety of applications. Indeed, almost all the users responded that the system would be useful in meetings where face-to-face talks are hard to conduct and in broadcast programs. We plan to explore such possibilities.

3.7 Proposal and implementation of information systems that facilitate information distribution in communities

We have proposed and implemented VoiceCafe, a system facilitating conversation in the real world by supporting the exchange of information between network and real-world communities.

3.7.1 VoiceCafe, promoter of talk in real-world communities

VoiceCafe is an interactive, information-providing system for real-world communities (Fig.7, [Fukuhara 2000][Fukuhara 2001]). VoiceCafe, with its text-to-speach system and speach recognition system, enables communication between humans and electronic systems. This system enables conversation-based meeting sites and group communities and encourages talk among people. We have obtained insights about the interaction between artificial and human life.

3.7.2 Implication and future plans

VoiceCafe is a new approach for facilitating information distribution in a community. We will apply the proposed system to actual communities to test its effectiveness.

Fig.7 VoiceCafe

3.8 Communication systems, embodiment, and situation

We propose the development of artifacts with the capacity to interpret non-verbal information during communication, particularly, embodiment and situation. We are investigating a new communication system that takes into account the influence of embodiment and situation through the construction and operation of the system.

3.8.1 embodiment and situation in communication

Around 60% to 70% of the information exchanged between humans during communication is conveyed by non-verbal media. A typical form of non-verbal media is gesture. Gesture is regarded as a communication tool that is intentionally used for the transfer of information. On the other hand, information can be expressed unintentionally by such means as body expression and situation. We are not interested in using such means as communication tools, but we are interested in understanding what they convey during communication. A communication protocol may depend on the embodiment. For example, when driving a car, the car can be regarded as an expansion of the driver: the car can use its lights, horn and speed to communicate with other cars. Although the horn can be used either as a warning or a greeting, the drivers know which is the case since they share the same environment.

We are implementing a prototype of the artifact that communicates with humans through embodiment and shared situation to clarify the scope and limitations they provide during communication.

3.8.2 Active affordance

We propose an artificial system that realizes an active affordance that works to articulate non-verbal information, such as body language and environment. “Affordance” is a word that refers to the function of a thing. For example, the chair has an affordance for sitting. Affordance originally implied what a human sensed from an object and it has a passive implication. In this research, we propose an active affordance in order to clarify how body language and environment are used during communication. Since artifacts each have a specific function that depends on the human body and environment, they must be capable of using non-verbal information properly, such as embodiment and situation, in order to behave appropriately.

Fig. 8 illustrates an example of an artifacts that realizes active affordance. The chair in the figure behaves properly, sensing the embodiment of the person and the situation. The function of a chair is to seat a person on itself. However, if the person is a short infant, the infant may not be seated. Besides, the person who keeps standing to work does not want to be seated. The body language and environment can be sensed by analyzing the human behavior through detection with a motion capture system.

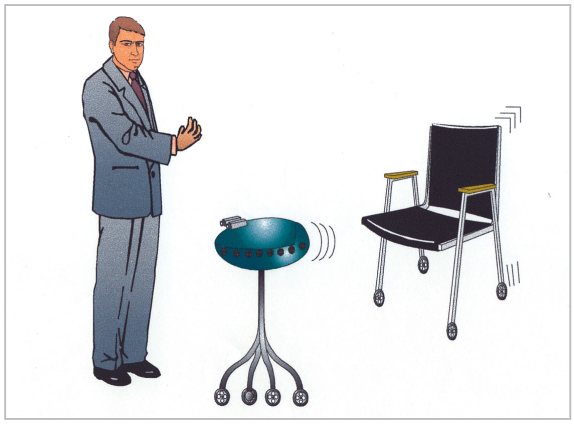

Fig.8 Artifacts that realize active affordance

3.8.3 Implication and future work

Little attention has been paid to embodiment as a communication medium. The engineering goal of this research is to design a new communications system by considering embodiment and situation. It may be a step toward a new communication system to construct an artifacts that articulates embodiment and senses the situation and to estimate the effectiveness of such an entity.

4 Toward community informatics

As mentioned above, POC includes a number of interesting challenges spanning several research fields such as social psychology, cognitive psychology, and info-communication engineering. The majority of them contribute to close ties between a synthetic approach and an analytical approach, that results in the design of new information tools. POC can be regarded as a routine interdisciplinary research theme related to the design of social intelligence.

In the long run, we would like to generalize social intelligence design into community informatics aiming at understanding and developing information tools that help community members understand the process of developing their activities on the basis of information infrastructure.

One interesting goal of community informatics is to provide a theory for creating a society where information flows like a wind(1). In such a society, info-communications technology would blend seamlessly into everyday life, comprising a part of all activities. The expression "society where information flows like a wind" is a metaphor. Fundamentally, information constantly changes its form. We aim at a community where everyone can feel the existence of information as easily as they can feel the wind.

It may not be a good idea to discuss community informatics from technology-focused viewpoints. In general, engineers are likely to wear rose-colored glasses when picturing a technology-oriented future society, focusing excessively on cutting-edge, innovative ideas and technologies. They tend to avoid thinking about basic issues like how the info-communication technology will change our lives and whether such change will be acceptable to us.

In the 20th century, which was an expansive period in terms of materials and energy use, the changes caused by technology were physical ones that we were able to understand objectively. The changes caused by info-communication technology, however, act directly on the human mind. Therefore, it is often very hard to judge their impact objectively.

Any new communication technology has both merits and demerits. While info-communication technology has made our daily lives very convenient, it has also posed ethical and moral problems in society. Among the problems are the digital divide and the social instability caused by the Internet, and the highly isolating aspects of anonymous human interactions fostered by cell phones. Yet, it is expected that a methodology for understanding, designing and accessing the communication technology can be established.

The value of community informatics should be evaluated in terms of everyday life, such as its adaptability to human society, ease of understanding, usage, and acceptance. In other words, the core issues related to the development of social intelligence in the network community do not center on problem solving, demonstration and optimization, but on concept proposal, conviction, and design.

It is hard to expect that everybody agrees on an established, objective standard for evaluating the contribution community informatics can make to human society. The research of community informatics is hypothetical and theories will be forged by trial-and-error through discussions. Each community itself decides whether it accepts the theories or not. Community informatics is a research area that targets all the interactive activities of humans and communities. It is interactive in nature.

(1) The idea "Society where information flows like a wind" originated in the discussion between Shintaro AZECHI and Kazunori FUJIMOTO.

5 Conclusions

We have proposed an interactive broadcast medium (POC: Public Opinion Channel) for supporting community knowledge creation by interdisciplinary research closely related to social psychology, cognitive psychology, and info-communications engineering. Some POC-related examples of specific approaches based on social psychology, cognitive psychology, and info-communications engineering have also been presented to indicate that such approaches can be explored when researching models for social intelligence. We have also discussed how such approaches might be generalized into community informatics.

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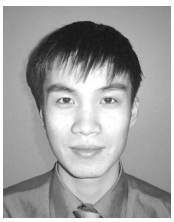

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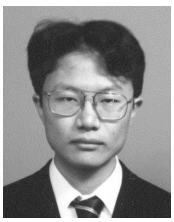

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Community knowledge creation by using conversational agents