Incentive Mechanism for Managing Large-Scale Internet-based Discussions on COLLAGREE

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1. INTRODUCTION

Much attention has been focused on the collective intelligence of thousands and thousands of people worldwide [Introne et al. 2011] [Malone et al. 2009] [Malone and Klein 2007] [Gurkan et al. 2010] [Landoli and Klein 2007] [Klein 2007] [Klein 2012]. Interest continues to increase in online democratic discussions, which might become one of the next generation methods for open and public forums.

To harness collective intelligence, **incentives** for participants are one critical factor. If we can incentivize participants to engage in stimulating and active discussions, the entire discussion will head in fruitful ways and avoid negative behaviors that encourage ”flaming.” ”Flaming” means a hostile and insulting interaction by Wikipedia.

In our previous work, we developed an open web-based forum system called COLLAGREE [Ito et al. 2014] that has facilitator support functions and deployed it for an internet-based town meeting in Nagoya as a city project for an actual town meeting of the Nagoya Next Generation Total City Planning for 2014-2018 [Ito et al. 2014]. Our experiment ran on the COLLAGREE system during a two-week period with nine expert facilitators from the Facilitators Association of Japan. The participants discussed four categories about their views of an ideal city. COLLAGREE registered 266 participants from whom it gathered 1,151 opinions, 3,072 visits, and 18,466 views. The total of 1,151 opinions greatly exceeded the 463 opinions obtained by previous real-world town meetings. We clarified the importance of a COLLAGREE-type internet based town meeting and a facilitator role, which is one mechanism that can manage inflammatory language and encourage positive discussions [Ito et al. 2014].

While facilitators, who are one element of a hierarchical management, can be seen as a top-down approach to produce collective discussions, incentive can be seen as a bottom-up approach. In this paper, we focus on incentives for participants and employ both incentives and facilitators to harness collective intelligence.

One of the most well-known success stories about incentives is the 2009 DARPA Network Challenge, where competing teams were asked to locate ten red weather balloons placed around the continental United States. Using a recursive incentive mechanism that both spread information about the task and incentivized individuals to act, the MIT team won the competition by finding all ten balloons in less than nine hours [Pickard et al. 2011].

In this paper, we propose an incentive mechanism for large-scale collective discussions, where the discussion activities of each participant are rewarded based on their effectiveness, inspired by the above winning incentive mechanism [Pickard et al. 2011]. With these incentives, we encourage both the active and passive actions of participants. Active actions include posting opinions, replying, and agreeing and should be done for warming up discussions. Passive actions, which include getting replies and gaining agreement from others, are more highly rewarded in our system. Such passive actions suggest that one’s opinions are being interested or supported by others. In other words, they submitted opinions that did not lead to impassioned responses from other participants.

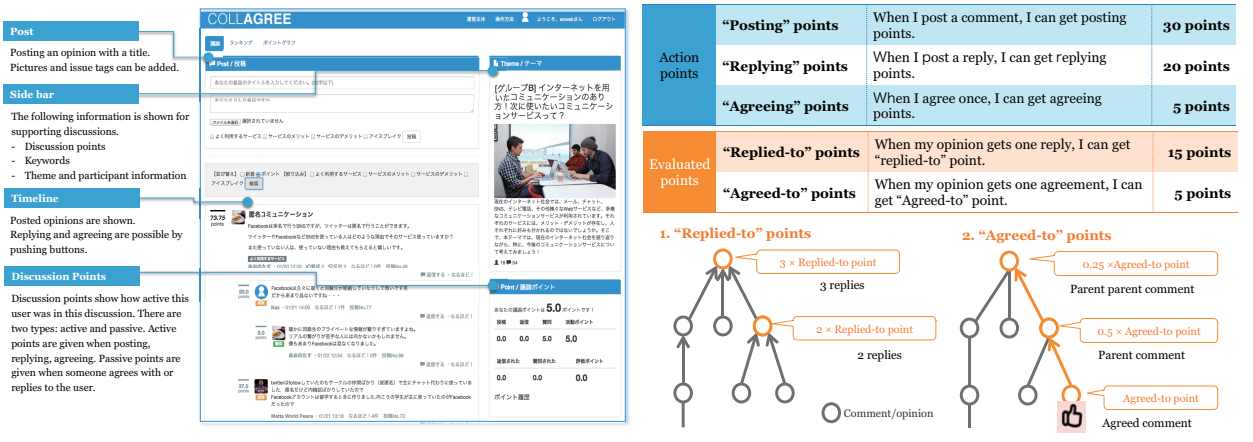

Fig. 1. User interface and discussion points

The rest of this extended abstract consists of the following sections. In Section 2, we outline the incentive mechanism of our COLLAGREE system. In Section 3, we present a large-scale experiment with the Aichi Prefecture local government and some preliminary results. Section 4 gives concluding remarks.

2. INCENTIVE MECHANISM FOR LARGE-SCALE DISCUSSION

As an incentive mechanism, we adopt **discussion points**. The left side of Fig. 1 shows a typical user-interface of our system. Users can post opinions/comments from the top boxes. The side bar has functions for showing discussion points, user rankings of discussion points, highlighted keywords, themes and participant information. The timeline shows a sequence of opinions and replies to them. Users can re-order the sequence by points, keywords, etc. By re-ordering the points, users can easily find the focused and noted discussions from the timeline.

The right figure in Fig. 1 gives a detailed description of the discussion points as an incentive mechanism in COLLAGREE. We have two types of discussion points: action (active) and evaluated (passive).

The action points are posts, replies, and agreeing points, all of which are obtained when a user acts by posting, replying, and agreeing. We expect these points to encourage users to actively post, reply, and agree.

The evaluated points are the points to which others replied and to which they agreed. If posted comments are replied to or agreed to, they can be seen as somehow ”evaluated,” suggesting that they have some discussion value. Thus, we give discussion points to these comments. We expect that evaluated points will encourage participants to submit more thoughtful comments so that they get replies or agreements. We adopted a recursive (or propagating) pointing idea for the agreed points; if comment X is agreed with, then its ancestor (parents) comments are also evaluated because these ancestor comments could produce comment X that was agreed with. This incentivizes the participants to make more thoughtful comments to solicit agreements and replies.

3. EVALUATION AND LARGE-SCALE EXPERIMENT IN AICHI PREFECTURE

Currently, we are engaged in a large-scale experiment with local governments in Aichi prefectures. In this experiment, the participants discuss current city planning issues for the towns and cities in

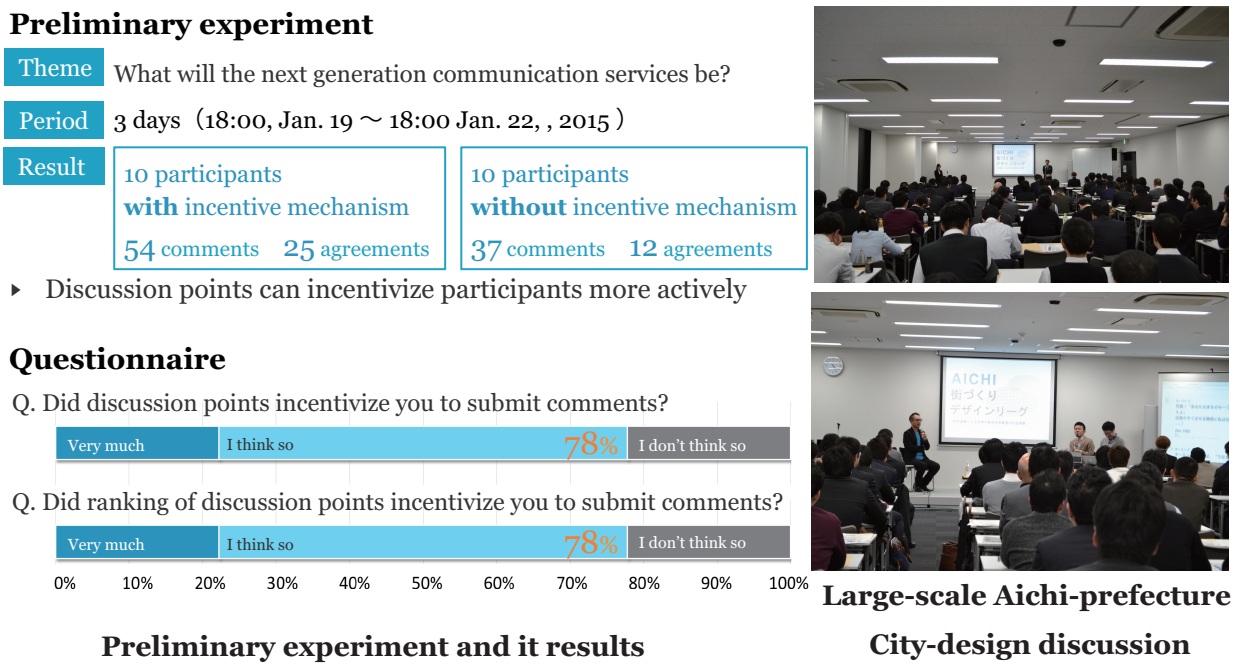

Fig. 2. Preliminary and large-scale experiments

Aichi prefecture, which has over 7 million people, and around 60 local towns and cities. We gathered representative citizens from the local government offices of the towns and cities. The first day is an event where guest speakers discuss the city planning issues face-to-face (Fig. 2), and then the participants continuously discuss them by COLLAGREE for another ten days. This ongoing experiment will be summarized soon. So far, we have gathered around 300 opinions from the first two days, and the discussions have progressed effectively. We identified no inflammatory language.

To confirm the effectiveness of our incentive mechanism, we did a 3-day preliminary experiment with 20 subjects. The description on the left in Fig. 2 shows its setting and results. The theme was ”What will the next generation communication services be?” Ten participants used the incentive mechanism (discussion points), but the other ten did not. Our result show that the discussion **with** the incentive mechanism produced more comments, opinions, and agreements. The initial result shows the positive effect of the incentive mechanism. However, since this is just an initial result, we need more experiments to confirm this effect. The answers to our questionnaires showed generally positive results: ”Did the discussion points incentivize you to submit comments?” and ”Did ranking the discussion points incentivize you to submit more comments?” For both questions, 78% of the participants answered ”I think so” or higher.

4. CONCLUSION

We deployed COLLAGREE, an open web-based forum system [Ito et al. 2014] with facilitator support functions, for Nagoya's next generation city planning project. We proposed an incentive mechanism including recursive discussion points for user discussion actions. Currently, we are doing a large-scale experiment in Aichi prefecture by COLLAGREE with this incentive mechanism. Our preliminary experiment demonstrated that our discussion point mechanism can incentivize participants to act positively and nicely in discussions.

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