

Challenges and Opportunities of Local Journalism: A Case Study of the 2012 Korean General Election

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ABSTRACT

Local journalism is a vital element for governance and civic engagement in local communities. It not only serves as an accountability mechanism for key local institutions but also enhances communities' problem solving skills by setting important agendas and opening public discussions. However, the Internet is posing serious challenges to local news outlets that lead to a significant reduction of accountability reporting and decreasing revenue. In this paper, we study the challenges and opportunities of local journalism in online communication space. We first observe the status of local journalism in online discourse by analyzing the public attention to local news outlets. Using Twitter to capture online public discourse, the study provides a large-scale quantitative analysis of the public's attention to local journalism. We also explore the potential to promote local journalism with information systems through a real deployment study. We propose a context-specific, decision-oriented design approach for local journalism, and evaluate it using Informed Citizen, a web portal to local journalistic contents of electoral districts.

Author Keywords

Local journalism, social media, web-based interactive systems.

ACM Classification Keywords

H.4.3. Information browsers.

INTRODUCTION

The disruption of local journalism is an unexpected consequence of the Internet that seriously threatens local public discourse. Local news outlets are suffering from

decreasing revenues, reducing staff journalists, and putting less effort to accountability reporting [27]. Such impact is dangerous. Weak local journalism cannot enable communities to hold accountable of the key institutions, such as local government, public transportation, courts, and schools. It harms the communities' problem-solving capability by making community members be ignorant of and alienated from local issues, those that are often more important and directly affects them than national-level agendas, and those they could have played an active role for.

In this paper, we first investigate the status of local journalism in online public discourse through a popular social media, Twitter. Our investigation provides a large-scale, quantitative understanding of the public's attention to local journalism. It is based on a real online environment that captures what people actually shared and discussed about. The investigation is conducted during the 2012 Korean general election, a contentious period when the issues of both national-level and local-level compete for public attention. Taking advantage of the period, we further conduct a comparative analysis of the attention to national-level issues and local issues. Selection of Twitter for our study is also meaningful; it is a new vibrant public communication space that is increasingly acting as a major news delivery channel. Our analysis provides a deeper understanding of social media in terms of local journalism.

Secondly, we explore the opportunity of information systems to promote local journalism. The exploration is important since information systems can provide alternative solutions that are independent of local news outlets, and the benefits of good solutions can trickle down to local news outlets, local discourse, and, ultimately, to the community. It is also potentially a large research space composed of many different dimensions, for example, finding the needs and interests for local journalism, deeper understanding of the context of the needs, design of information interfaces, and development of required techniques. As our initial exploration of this space, we conduct a concrete case study under a specific context. We

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developed Informed Citizen, a portal-site to journalistic contents of electoral districts, and deployed it during the election period.

Informed Citizen (IC) embodies a context-specific, decision-oriented design approach for local journalism. Considering the electoral context, IC attempts to closely connect the journalistic contents with users' voting decision making activity: it collects journalistic contents of local electoral districts, provides a candidate-based frame of contents to enable users to compare and evaluate local candidates, and supports a bookmarking interaction that helps users check what they think important and reflect on them. The deployment result shows that IC encourages the users to engage in the news and agendas of their electoral district and consider them in the voting decision. Our study provides a promising design direction for local journalism websites that can be applied to other contexts.

BACKGROUND AND RELATED WORK

Internet and local journalism

As the Internet created a deep fundamental change in public communication, its impact on local journalism is complex and multi-faceted. While various aspects of the impact are being studied, many studies view the impact from the news producer's side. Studies on the business aspect report that the advertisement revenues are largely bypassing the traditional news media [18]. This results in reduced editorial spending and a sharp decrease in accountability reporting staffs, which is hardly filled by new investments and employments in new local media start-ups [7]. A study that analyzed the content aspect in Baltimore reported that, despite the increase in the number of local publishers, coverage of critical civic issues mostly relied on traditional local media, and those traditional media were also reducing the coverage of those issues [2]. While there are many reports on the new participatory aspect and citizen journalism, a number of analyses show that the core accountability reporting is still performed by the traditional media outlets [23]. Different from the above studies, our work attempts to observe the impact from the consumers' perspective, specifically the consumers' attention to local journalism. It provides an expanded view by observing the actual public discourse, which is beyond the news production stage view.

Social media and public discourse

The importance of social media as a space for news distribution and public discussion has already been observed in many works. Kwak et al. [13] conducted a study with an early stage of Twitter and observed that it shows characteristics as an information dissemination medium than a social networking service, and Tsagkias et al. discussed that much of what is discussed is inspired by the news [26]. A number of works used social media to capture the public responses to important situations such as disaster or crisis [21], political protests [25], and popular events

[24]. Our work contributes to the works of this area by introducing a new topic, local journalism in social media discourse, and providing an analysis of its current status.

One line of relevant research on social media is the studies of political or ideological polarization [1, 5]. The studies observed the network and information diffusion behavior of people with different political preference. These works generally interpreted diversity based on opposing political views or pro vs. con. Our work adds a different dimension to diversity analysis. We focus on the inclusion of local news and issues in public debates rather than on the opposing perspectives.

Information interfaces for news and public discourse

HCI researchers are experimenting different tools and interfaces for high quality public discourse. Diakopolous et al. developed Videolyzer [6], a tool designed to collectively annotate and share information quality of political videos. Kriplean et al. [12] deployed a web-based discussion platform to support public deliberation. A number of tools are developed to encourage diversity exposure in the context of news reading [17, 20], and comment browsing [8, 19].

Kavanaugh et al. [10] covered a closely related topic, adding social features in local news aggregators. They reviewed existing local news aggregators in terms of social interaction features, and presented a design of a local news aggregator that includes social features such as commenting, tagging, and sharing of articles.

LOCAL JOURNALISM IN ONLINE PUBLIC DISCOURSE

In this section, we describe our study about the status of local journalism in Twitter. The study analyzed the discourse around political news and the candidates of the election during an election period.

2012 Korean General Election

We first briefly describe the Korean general election held in 11 Apr. 2012 to provide the context of our study. The election organized the 19th national assembly, which consists of 300 seats, 246 directly elected seats and 54 nationwide proportional representation seats. The voters cast two votes, one for the candidate of their district and one for the party they support. The directly elected seats are filled with the winners of the 246 single-member districts and 1,114 candidates competed for the seats. 54 seats are allocated to parties according to the proportion of votes received and the parties listed 188 candidates. The official campaign period was from Mar. 29 to Apr. 10 and four parties won seats in the election.

Election periods provide a useful environment for observation of public discourse [15, 16]. During the period, policy debates are made over public issues of various areas and are extensively covered in the media. Many media research works also considered this point and conducted

studies during election periods. Particularly, the general election we studied also provides an opportunity to observe local discourse since it requires decision making for both national and local constituency levels.

Data Set Development Method

Our analysis requires a data set that captures the discussion of public issues in Twitter. For data set development, we used two approaches, one with political news articles and one with candidate names. The first approach considers the characteristic of Twitter as a news dissemination medium. It identifies the discussed issues by observing the Twitter’s response to the news articles published during the election period. This approach treats the news articles as a knowledge base of public issues, and collects the tweets that include links to the articles in order to identify what issues are picked and discussed in Twitter. Similar approaches were effectively used in other Twitter analysis works as well [3].

The second approach collects the tweets that include candidate names. The candidates are the core and symbolic elements of the election, and their name can serve as a space for observing the distribution of public attention. This approach also partly addresses the limitation of the first approach, which is that it cannot capture the discussion of the issues that are not linked to news articles.

We also considered several other approaches. Keyword cue-based collection (e.g., hashtags or trending terms) is often used [25, 5] to identify popular issues and collect related tweets; however, our interest was to have an overview of the discourse rather than to focus on a number of selected popular issues. In addition, the effectiveness of hashtags was limited for our analysis. As reported in [9] hashtags are less popular in Korean compared to English (the use was even less, 7.99%, in our own measurement).

Mining topics or issues from a large collection of tweets is another promising approach and is being actively researched in the data mining and information retrieval area [4, 22]. Despite recent advances, we did not adopt it for our study since topic identification or topic-based clustering of tweets is in the experimental stage, especially for our target language, Korean. We describe the data set in detail together with the analysis result below.

Local News in Social Media

We tried to make sense of the circulated issues and the position of local issues among them by observing the spread of news articles in Twitter. The analysis traced the circulation of news articles, especially the articles from local news outlets, and the issues covered by the articles. The data set is described below.

Data set 1. Tweets to Politics-Election Coverage (TP set): TP set aims to collect tweets made to all political news articles published during the election period. We first created a comprehensive collection of news articles on

politics or the election through a news search engine using very general keywords (e.g., “candidate”, “president office”, “election”, names of the parties, and so on) that frequently appear in such articles as queries. We crawled all the news articles returned by the news search engine, 42,638 articles published by 134 sources.

The tweets linking to these articles were collected via Tweetmix (tweetmix.net), which aggregates Korean tweets based on the address of the included link (Shortened URL is also addressed by restoring the original address). We crawled all the tweets linking to the collected news articles, their posting time, and user’s ID and profile information. 165,678 tweets from 30,214 users were collected. 8,760 out of the 42,638 articles received at least one tweet.

Concentration to a few national issues

We used the number of (re)tweets per article as a dissemination metric. According to our measurement, local news articles were rarely distributed and a few national issues dominated the news circulation. It is true that local news outlets may not often reach out a large proportion of users due to the limited range of coverage and demographical reasons. However, the circulation was much lower than expected. Although the local news outlets outnumbered national outlets, the number of tweets received by the entire local news outlets was only 5%. Moreover, not all of the 5% were referring to pure local stories. Among the top twenty articles within that 5%, 11 articles were related to nationally recognized candidates or issues. The result shows that local agendas are hardly raised or addressed in social media.

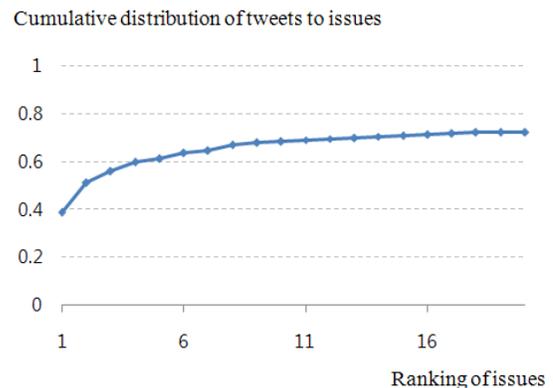


Figure 1. Cumulative distribution of tweets to issues.

On the other hand, the issues that were frequently covered in the national media dominated the circulation. In order to observe the dominance, we identified the top twenty most frequently covered issues from the national news outlet that received the most (re)tweets. The selected issues were those that received nationwide interest, for example, the illegal surveillance incident¹, past raunchy remarks of the

¹http://www.koreatimes.co.kr/www/news/nation/2012/04/116_108429.html

candidate Kim, four major river project², and Korea-U.S. free trade agreement. We then manually compiled a list of keywords for these issues and measured the number of articles circulated in Twitter that include the keywords. We also measured the number of tweets the articles received.

42% (3,742 of 8,760) of the circulated articles in Twitter covered one of the twenty issues, and they received 72% (119,897 of 165,678) of the (re) tweets. Specifically, 39% (63,839 of 165,678) of the tweets were referring to the most popular issue, and 61% (101,289 of 165,678) covered one of the top five issues (See Figure 1).

Interestingly, four of the top five issues in Twitter were the same as those of the national news outlet we used, which implies a strong influence of the national news media to social media. The illegal surveillance incident was the most popular issue in both media, followed by the issues about the candidate Kim's past remarks, Korea-U.S. free trade agreement, and four major rivers project.

Local Candidates in Social Media

As many issues are related to the candidates during the election, analyzing the attention given to local candidates helps us understand the amount of attention given to local issues. The data set used for the analysis is described below.

Data set 2. Tweets with Candidate Names (TC set): We collected the tweets that include a name of a candidate regardless of the inclusion of links to news articles. Using the names of all 1,114 candidates as queries, we collected the tweet search results via Topsy (topsy.com). 495,653 tweets were collected.

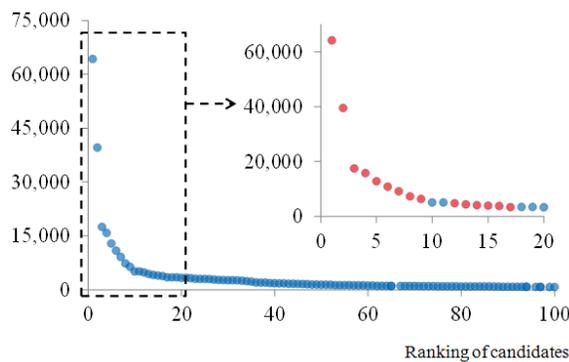


Figure 2. The frequency of candidates' name in Twitter.

Concentration to nationally recognized candidates

The concentration was similar in the discourse around the candidates. Tweets were extremely concentrated to a few nationally recognized candidates although there are more than a thousand candidates. Figure 2 illustrates that the frequency of the candidates' name in the TC set follows a power law distribution. The top twenty candidates were

mentioned in nearly 50% of the entire collected tweets and the top-five candidates appeared in one third of the tweets. Among the top-twenty candidates, fifteen were nationally recognized candidates (shown as red dots in the magnified area of Figure 2). These top candidates are usually the leaders of the parties, potential presidential candidates, and their competitors. As the attention is extremely skewed, most of the candidates are located at the tail.

Similarity between Social Media and National Media

We additionally observed that the allocation of attention in social media is very similar to that of national news outlets. The similarity is observed from the ranking of the top twenty issues identified in the previous analysis. In order to calculate the issue ranking of the national news outlets, we first excluded the articles published by the local news outlets from the entire 42,638 articles collected for the TP set. We then counted the number of articles of the corresponding issues. The issue ranking of the social media is based on the number of tweets made to the articles of the issues.

Kendall's τ was used as the metric, which ranges between -1 and 1, where the value 1 represents that the two rankings are completely identical and -1 represents a complete reversal. If there is no correlation between the rankings, the value becomes zero [14]. The ranking of the twenty issues were similar between Twitter and the national news outlets, resulting in the Kendall's τ value 0.568 ($p < 0.01$).

We also tried to compare the similarity of issue ranking between social media and local news outlets; however, it was difficult since local news outlets focused on different stories and the top issues hardly overlapped with those of Twitter.

The similarity between the national media and social media was alike for the candidate ranking (See Table 1). The candidate ranking of national news outlets was calculated in the same manner as the issue ranking. The candidate ranking of the social media is based on the frequency in the TC set. The Kendall's τ value was 0.590 ($p < 0.01$).

Table 1. The similarity between mass media and social media.

	National media	Local media	
		Busan	Joongdo
Twitter	0.590**	0.198**	0.110**

** : p-value < 0.01

However, the similarity in the candidate ranking between Twitter and local news outlets was relatively lower. We picked two local news outlets (Busan and Joongdo) and calculated the candidate ranking. The Kendall's τ value was 0.198 ($p < 0.01$) between Twitter and Busan, and 0.110 ($p < 0.01$) between Twitter and Joongdo.

²http://en.wikipedia.org/wiki/Four_Major_Rivers_Project

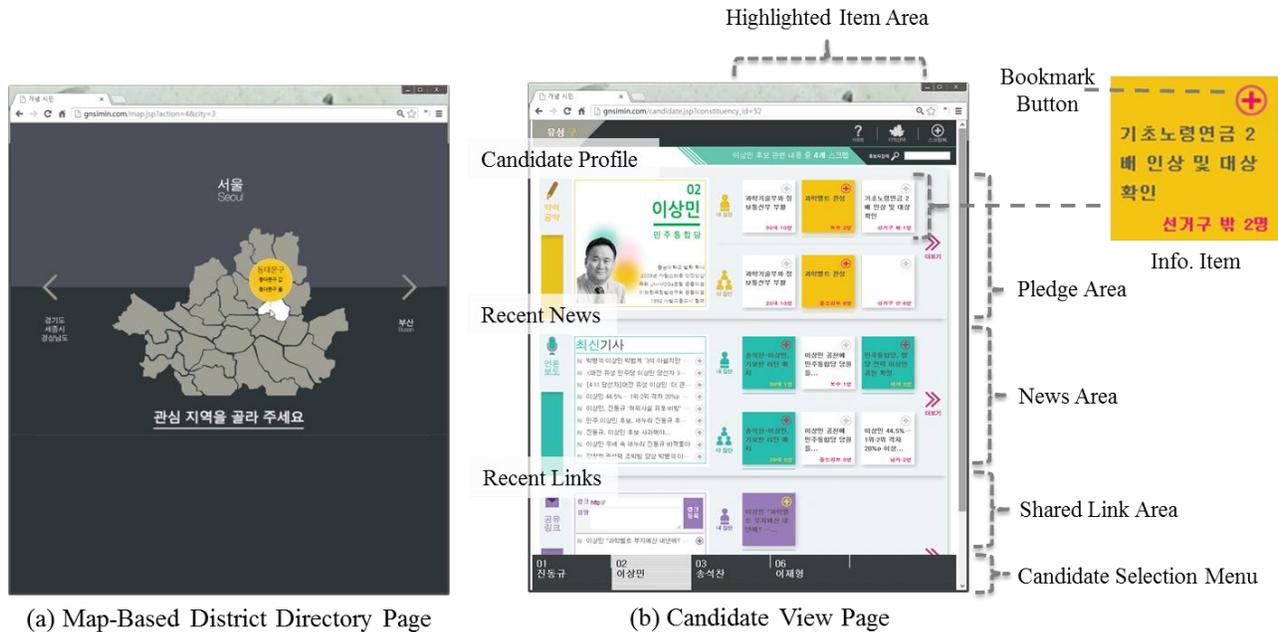


Figure 3. (a) Map-based district directory page (b) Candidate-view page.

INFORMED CITIZEN: CONTEXT SPECIFIC, DECISION ORIENTED DESIGN FOR LOCAL JOURNALISM

One line of our work is to explore the opportunity of information systems for local journalism. Our approach to engage users to local journalism is to shape the contents to be compelling information for their decision-making. The approach takes advantage of the election period, when the public has a common decision to make. Although our design approach has targeted a specific electoral context, we believe it is possible to apply the same approach for different decision-making processes of local communities.

To develop re-usable guidelines and a specific case, we describe our outlook of the design space and the design choices made for Informed Citizen.

Selection of Content

Selection of the content to deliver through the system is the first thing to consider. There can be multiple selection criteria. A system can focus on specific topic categories such as politics or environment, or on particular institutions or people that are important to the community. The selection can also be made considering information producers or sources such as professional journalists, grassroots sources, and experts.

In the case of Informed Citizen, the choices are made regarding the goal of supporting the electoral decision of each local district. IC focuses on politics and election related content in terms of topical category. It also considers the sources of information and attempts to collect from various providers in order to provide rich information and diverse views. We developed Informed Citizen to provide three types of contents: pledges of the candidates,

which present their views to the election; news coverage of the candidates that reflects the view of traditional news media, and links shared by users in a grassroots manner. For practical reasons, IC covered three metropolitan areas and several satellite cities, 85 districts and 309 candidates in total.

In order to gather the pledges of candidates, we manually collected the pledges of the 309 candidates from their personal website, communication materials, and the pledge archive of the national election commission. As for the news coverage, a news article crawler was built to collect news articles that mention the candidates. The crawler runs every three hours and collects the news articles that include the name of a candidate from a news portal. In order to enable grassroots sharing, IC also allows logged-in users to share links with a short comment.

Framing of the Content

Design of the presentation of the collected content is a key issue that establishes the identity of the system. A general direction typically used by traditional news outlets is to present a combination of various topics, which is useful for aimless browsing. There are multiple detailed options within this direction. The presented topics can be organized based on content features, for example, topic categories or newsworthiness. There are also choices in terms of the entities participating in the presentation, for example, solely based on journalists, the crowd as in social recommendation systems, or mix of them.

We believe that another direction is to put specific contexts or goals of users in the center of the design, and frame the information as resources for users' decision-making. This

direction will be effective for engaging user groups that have a common decision to make. Following this direction, the content frame of IC is tailored to the expected primary objective of users, which is to learn and evaluate local candidates. It uses a candidate-based organization of contents to give an overview of the contents related to each candidate and facilitate the comparison between the candidates (Figure 3-b).

The candidate-view page has three sections, one for each content type, and the boxes of the grid present each item. A user can zoom in to one item by clicking the box. Users are sent to this page as they pick a district from the map-based directory page (Figure 3-a). Among the candidates, IC first randomly shows one from the ruling party or the opposition coalition. Users can move to different candidates' page using the candidate selection tab located at the bottom. Six items of each content type are displayed in the highlighted area. For the content types that can be dynamically updated, i.e., news and links, a separate tab is allocated for recently updated items. Users can browse more items using the "More" button, which leads to a page that lists the entire items of the selected category.

Different design choices can be made for different user contexts. For example, if a community has specific issues that are widely agreed as important agendas, contents of the issues may be organized in a pro vs. con frame as in [12].

Interaction Design

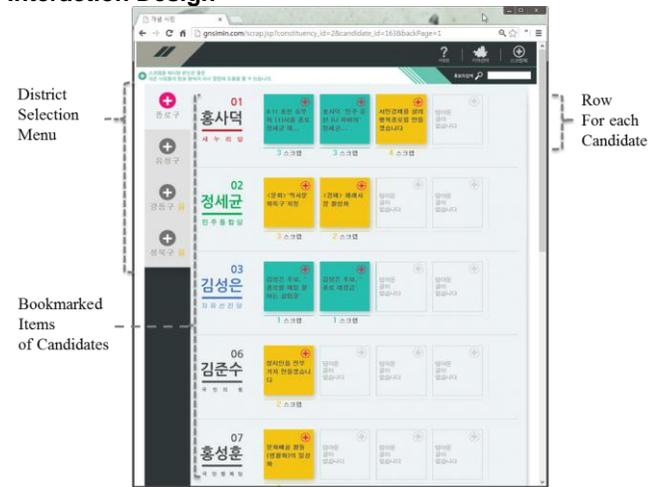


Figure 4. Scrapbook page.

If a system aims to support specific goals or actions of users beyond simple browsing, there are opportunities to design and add interactive features to enhance user experience. While there can be a wide variety of possible interactive features depending on the targeted experience, existing works on interfaces and tools related to journalism and public discussion suggest important design directions. Designing interactive features for users' deliberation [12] is a promising direction, especially in decision-making

scenarios. Raising awareness on credibility or encouraging healthy criticism is meaningful in the interaction with journalistic contents [6]. Exposing users to a diversity of perspectives [17, 20] is also a valuable direction to pursue for quality public discourse.

As for IC, we designed two interactive features to support users' evaluation of candidates. First, IC provides users with a bookmarking function. It helps the users distinguish the items of their interest and reflect on them. The function aims to encourage users to conduct more concrete evaluation of candidates based on detailed criteria. Users can bookmark an item by clicking the bookmark button of the corresponding box. The color of the bookmarked item changes to give visual feedback. Each user has their own scrapbook page that collects the bookmarked items (Figure 4), and the user can recall and focus on the selected items in the evaluation process.

Second function is bookmark-based diversification. IC attempts to diversify the highlighted area by showing the items that are bookmarked by people with different characteristics. We conjectured that people with different demographic-political features might have different perspectives, hence, consider different items importantly in the evaluation of the candidates. IC uses three demographic-political features of users for this function: political orientation, age group, and gender (In order to identify the demographic-political features of the users, IC asks three questions when they join the website: gender, political orientation in a 5-point liberal conservative scale, age group that the user belongs to).

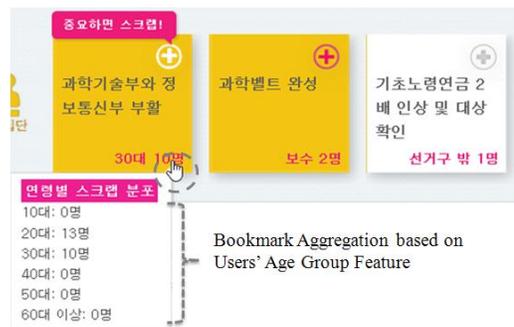


Figure 5. Distribution of users who bookmarked the item.

The diversification is performed as follows. Recall that six items are displayed for each content category in the highlighted area as in Figure 3-b. For each feature, IC attempts to select two items that were bookmarked from a user group of different feature value, for example, one that were frequently bookmarked by liberal users and one by conservative users. For each item of the highlighted area, IC also displays the distribution of users who bookmarked it (Figure 5). If the number of bookmarks is not enough to perform diversification, IC selects recently updated items.

FIELD DEPLOYMENT

Informed Citizen was opened to public a few days before the official campaign period and until the Election Day, from Mar. 25 to Apr. 11. In order to make the website to go viral, we introduced IC to several popular online communities and social media. In addition, for users who log in with their Facebook account, we made IC to automatically post a short introduction message on their wall so their friends could be aware of it. A number of influential bloggers and political pundits introduced IC and that also drove traffic.

There were 11,869 visits and 8,297 visits of them (70%) came from the three cities (Seoul, Daejeon, and Busan) that are covered by IC. While the ratio of the sessions that only visit the landing page was 66.8% overall, it was lower (58.3%) if we only consider the visitors who came from the three cities. 2,296 actually registered and used IC; the majority of the registered users (1,490) were affiliated to the districts covered by IC, and there were also 806 users who were not.

EVALUATION

We analyze the effectiveness of our design approach through the deployment result of IC. For the analysis, we use usage logs and a questionnaire. The usage logs are created by tracing the page views and clicks of the 1,490 registered users who were affiliated to the districts covered by IC. A questionnaire is conducted with 52 users, asking the perceived effectiveness on their decision making process. We describe the results below.

Usage log Analysis

From the usage logs, we tried to see if IC encourages users to engage in their local district. Thus, the log analysis used only the logs of the users whose district is in the covered cities.

The analysis clearly demonstrates that IC encouraged users to engage in their local district. The engagement to the local districts was observed in all browsing activities including district visits, candidate page visits, and item views.

First of all, 66.1% of the total district visits were made to the local district of the users. As a result, in most districts, the visits of affiliated users dominated those of other users (See Figure 6). The number of visits made by the affiliated users was greater than those made by non-affiliates in 67 (80.7%) districts. The 16 districts that showed an exception mostly had nationally recognized politicians as candidates or the number of affiliated users was very small.

This visit pattern is observed more clearly if we aggregate district visits by individual users. 69.9% of the users only visited their own district and did not visit any other district, and 85.7% visited their own districts more often than other districts.

In addition, a significant portion of the visits to external districts was made to nearby located districts, implying a locality in the interest of users. 40.7% of the external district visits were made to the districts that are right next to their local district. If we include the districts that are two hops away from their local district as nearby located districts, this number rises to 48%.

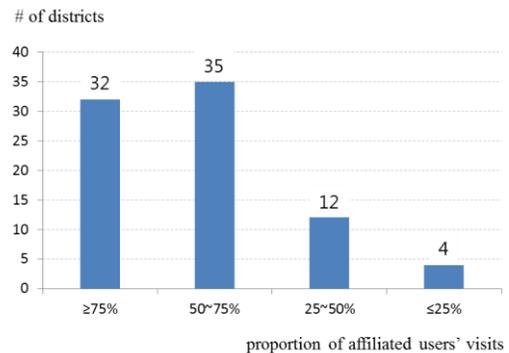


Figure 6. Distribution of districts by the proportion of affiliated users' visits.

Strong interest in local district is also observed from candidate page views. While the districts covered by IC had 3.72 candidates on average, the users viewed 2.73 candidates of their district. The number indicates that the users often not only viewed the two likely candidates (one from the ruling party and the other from the opposition coalition) but also the minor candidates who are rarely covered in the media. The average candidate page view was lower (2.26 candidates) for the visits to an external district.

The item views more clearly show that the users focused on their local candidates and agendas. Overall, 87% of the total item views were made in the users' local district. Except only eight districts, the number of item views made by affiliated users was greater than that made by external users. In terms of individual users, 88% of the total users browsed the local items more than the items of external districts. Even if we only consider the users who visited both local and external districts, 72.8% browsed the local items more.

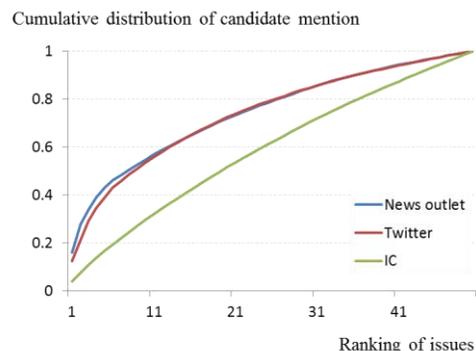


Figure 7. Comparison of the distribution of attention to top 50 candidates in Twitter, news outlets, and IC.

As the users were engaged to their own districts, the overall traffic was distributed across many candidates. This is different from the public attention observed in the mass media and Twitter. Figure 7 compares the difference in the distribution of attention observed in IC and the two media; As for IC, the distribution is computed based on the number of item views made in the candidates' page, that of the mass media is based on frequency in the TP news article set, and that of the social media is based on the frequency in the TC set. The figure shows that the attention is less skewed to the top candidates in IC.

Questionnaire

After the election, we randomly contacted 166 users via Facebook and asked to participate in the questionnaire, and 52 users completed it. The questionnaire was designed to understand the effectiveness of IC in terms of (a) evaluating candidates, (b) identifying important local agendas, and (c) and making the voting decision.

Seven questions asked the utility of IC in the evaluation of the candidates (See Figure 8). The questions are 5-point Likert scale questions and answers ranged from "1: Not at all" to "5: Very helpful."

We first asked a general question whether IC helped the evaluation of the candidates. 39 (75%) participants rated over the scale 4, and the mean value was 3.92.

For more detailed analysis, the next three questions were asked to a subset of participants depending on their preference of the candidates. Two of the three questions were asked to the participants who already had a preferred candidate and 24 responded. As for the question which asked if IC helped the participant better understand the preferred candidate, 20 out of 24 rated over four (mean=3.91). The other question was intended to observe the influence of IC on candidate preference, and asked the change in their preference using the scale from "1: became more negative" to "5: became more positive." Although the respondents had a preferred candidate in advance, a change was observed from a significant portion. Eight participants answered with the scale 3, which implies that IC did not influence their preference. The majority (13 participants) answered that they became more positive (scale 4 or 5), and there were also those (3 participants) who became negative to the candidate they originally preferred.

For the rest of the participants who did not have a preferred candidate, we asked if IC helped them find a candidate to support. 17 rated over the scale 4 and the mean value was 3.85.

Similarly, the next three questions were asked to a subset of participants depending on the dis-preference of the candidates. Two of the three questions were asked to the participants who already had a dis-preferred candidate and 33 responded. For the question asking if IC helped the participant better understand the candidate s/he dislikes, 15 (45%) out of 33 rated over 4 (mean = 3.52). The other question was intended to observe the influence of IC on candidate preference, and asked the change in their preference using the scale from "1: became more negative" to "5: became more positive." Although the respondents had a dis-preferred candidate in advance, a change was observed from a significant portion. Eight participants answered with the scale 3, which implies that IC did not influence their preference. The majority (13 participants) answered that they became more positive (scale 4 or 5), and there were also those (3 participants) who became negative to the candidate they originally preferred.

rated over 4 (mean=3.52). The follow up question asked the influence of IC on their attitude toward the candidate they dislike. Again, the attitude change was observed from a significant portion, from 21 out of the 33 respondents; 15 participants became even more negative (scale 1 or 2) and 6 participants said they became more positive (scale 4 or 5).

For the rest of the participants who did not dislike any candidate, we asked whether IC helped them identify a candidate they would not support. 14 answered with the scale over 4 and the mean value was 4.06.

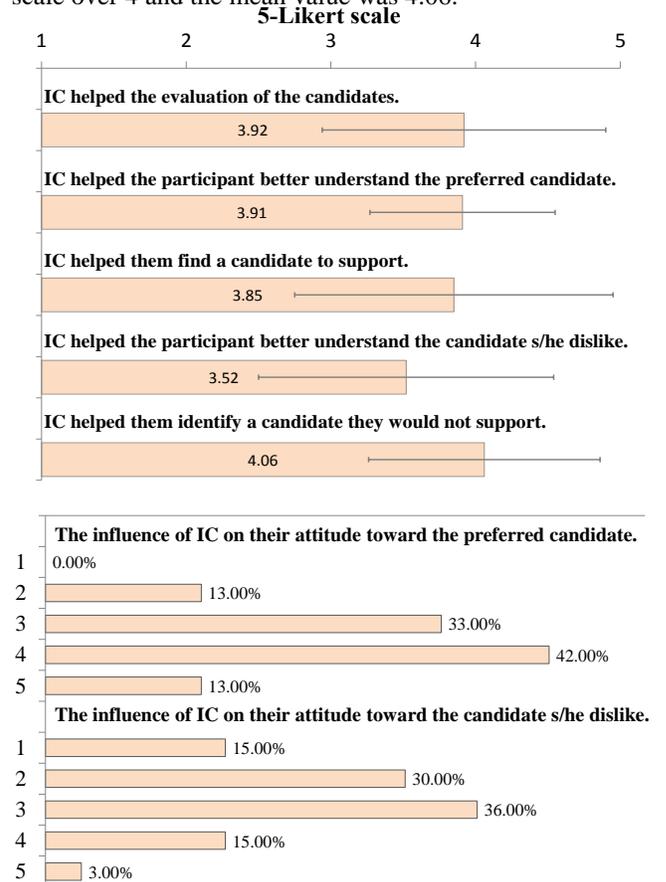


Figure 8. Seven questions about the effectiveness of IC in terms of evaluating candidates.

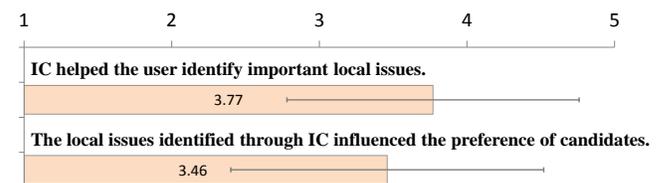


Figure 9. Two questions about the effectiveness of IC in terms of identifying important local agendas.

Two questions asked the effectiveness of IC for identifying important local issues (See Figure 9). As for the question asking if IC helped the user identify important local issues, 36 (69%) out of 52 rated over 4 (mean = 3.77). The other

question asked if the local issues identified through IC influenced the preference of candidates and 25 (48%) rated over 4 (mean = 3.46). As for the participants who rated below 3, we interpret that their perception of the candidates may have been influenced more by other factors such as party affiliation or past history of the candidates.

The last three questions intended to observe whether the usage of IC is meaningful in the decision making process (See Figure 10). As for the question asking if IC helped the user clarify the voting decision, 39 (75%) rated over 4 (mean = 4.06).

The next question asked in more detail about the importance of local candidates and issues in the participant's decision. 28 (54%) out of 52 rated over 4 for the statement that the candidates were an important factor in their decision (mean = 3.40) and 12 (23%) rated below 2. Interestingly, more number of participants answered that local issues were an important factor in their decision. 41 (79%) rated over 4 (mean = 3.89) and only 5 participants rated below 2. This may imply that some participants perceived local issues as a separate factor from the candidates, and considered them important in their decision.

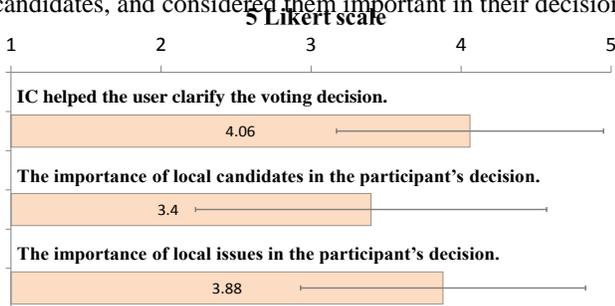


Figure 10. Three questions about the effectiveness of IC in terms of making the voting decision.

In summary, the questionnaire result shows that the majority of the participants evaluate IC to be useful in obtaining information about their local district and making their voting decisions. We believe that the engagement to local topics through IC can enable a more rigorous decision making process by providing users with richer information and nudging them to consider more diverse factors.

DISCUSSION

We discuss the implications and limitations of our study, and provide future directions. First, we analyzed the attention to local journalism in online discussion through a popular online communication media, Twitter. Twitter has many useful properties for our study; for example, it has a large number of users across wide geographic areas, many users frequently use it to communicate the news and public issues, and it captures the actual communication between users in an un-controlled environment, which is often difficult in offline experiments. Our observation also matches well with the studies that report the difficulties of local media outlets in terms of gaining traffic and related ad

revenue [27]. However, since Twitter may not sufficiently represent the general online discourse, similar study is required on different online spaces in order to accurately generalize our observations.

A possible direction is to the conduct the study in a different demographical setting. There are surveys reporting the demographic difference between Korean Twitter users and the general public in terms of age group and gender [11]. The attention to local topics may not be similar for different user groups as they have different social and cultural experience. The different intensity in the usage of social media may also lead to different result.

A related direction is to conduct the study in a different country. Our result may have deep relation with the socio-cultural context of Korea (e.g., scale, cultural and ethnical homogeneity, strong centralization around the capital city). Countries with different political system (e.g., federation of relatively autonomous regions) and ethnic diversity, or those with strong local media may show different result.

If there are online spaces that frequently involve local discourse and if those spaces form an important part in general online discourse, studies should also include those spaces and conduct comparative analysis with other online communication spaces.

Second, our design approach for local journalism interfaces seems promising at least in the electoral context according to our deployment results. We believe there is much opportunity to apply the same approach or extend it in different scenarios. Similar to an election, there are many situations that require evaluations or decision-makings from community members such as urban planning, school management issues, or environment problems. Supporting those situations will have a similar process to that of IC: collecting relevant information, organizing them based on available decision options, and supporting users' information acquisition and reflection. Thus, local journalism providers can apply the design approach to connect the content to users' actions. A practical future direction is to implement the design approach as a content management framework, and enable local journalism websites to deploy it in similar situations.

One limitation that we observed in the current design is the interaction features. The bookmarking function was not commonly used enough to observe potential bookmark patterns in relation to users' demographic-political features. Hence, bookmark-based diversification was not effectively performed and the highlighted area was often filled with recent items. This may be due to the short deployment period and the unfamiliarity of the interaction features. An alternative approach could be made by adopting a similar interaction feature with which people are familiar, such as the Facebook "Like" button, to increase the usage.

CONCLUSION

In this paper, we studied the status of local journalism in online discourse and explored the opportunity to promote local journalism. Using Twitter, our study showed that local journalism rarely gets attention and the amount of attention is much less than that of major national issues. Only 5% of the tweets were linking to local news stories and local candidates were not mentioned frequently in the tweets. The main topics of interest in Twitter were almost identical to those of national news outlets.

Through a real deployment study, we demonstrated that there is opportunity to engage people to local journalistic contents through alternative designs of information systems. We proposed a context-specific, decision-oriented design approach and develop Informed Citizen, which implements the approach. It closely connects local journalistic contents to users' decision-making process in an electoral context. We analyzed the usage of 2,296 users and reported the effectiveness of the design.

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