Contributors of Volunteered Geographic World: Motivation behind Contribution

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Abstract— Study of spatial volunteer demographics is critically needed for better design of future VGI projects and improvement of the existing ones for achieving retention of experienced volunteers. The problem being addressed is what motivates people to contribute for geographic information and services. The objective is to find a statistically meaningful list of volunteer motivators ranked relatively for the VGI organization under consideration. In this paper, we have surveyed volunteers of real world VGI projects belonging to organizations of GISCorps and OpenStreetMap. The paper is novel in terms of motivation factors validated by experiments and inputs taken from geospatial volunteers only. Measures for increasing the authenticity and validity of the contributed information have been derived from the survey responses.

I. INTRODUCTION

The content of VGI sites satisfies a variety of needs within industry, government and social networking communities. Due to growing popularity of VGI, there is a need to study motivational factors of the VGI volunteers so that the existing VGI projects get benefitted by eradicating volunteer motivation issues or problems.

In this paper, we intend to study what drives volunteers to contribute to geographic information. Studying these motivational factors will help in understanding reasons behind shying off of existing voluntary contributors. Related work on VGI motivational factors do not seem to be backed up by experimental validations. We have surveyed volunteers of two VGI organizations namely GISCorps and OpenStreetMap with the purpose of determining volunteer motivational factors. Understanding volunteer motivation will help in designing future VGI projects in a better and appealing way.

II. CONTRIBUTION

A. Limitations of Related Work

Goodchild’s [2]: It is unclear how the suggested 4 motivational factors have been arrived upon. Probably the outcomes are influenced by volunteer communities of Citizen Science projects. There is no mention of any kind of experimental approach backing up the findings.

Snyder et al [1]: The volunteer subjects on whom they worked were general social volunteers of unpaid helping activities. We have come 11 years down the line. Changes in economic situation, availability of information and technology at volunteer’s disposal have resulted changes in motivational factors.

B. Our Contribution

- Surveyed around 250 VGI volunteers from two kinds of VGI organizations and came up with a statistically meaningful list of 11 motivational factors (in contrast to 4 and 6 factors of the earlier works respectively).
- Quantitative and qualitative analysis of the survey responses and the demographics of the survey participants.
- Suggested measures to increase the authenticity and validity of the information contributed through VGI and thus help in the advancement of scientific studies and researches where VGI is used as research inputs.

III. PROBLEM STATEMENT

A. Problem Statement

Given:
- A set S, of VGI projects, P1, P2 …Pn.
- Sets of geospatial volunteers, V1, V2 …Vn for the projects, P1, P2 …Pn respectively.

Find:
- A ranked list L, of motivation factors behind the volunteerism activity of volunteers.
- Measures to increase the authenticity and validity of the information contributed.

Constraints:

During the study, we got access to the volunteers of only two organizations OpenStreetMap and GISCorps. Hence our results and conclusions are based only on volunteers from both the organizations.

Responses to the primarily important question of why people volunteer were collected in terms of 5-point likert scale. Likert scales are subject to distortion from several causes like central tendency bias of participants and social desirability bias. These two biases are constraints to our work.

B. Role and Significance of VGI in Advancing Science

Initial phases of VGI catered mostly for satisfying the intellectual curiosity of common public, but nowadays volunteers contribute to the breadth and effectiveness of services [4]. Apart from their contribution to the growth and welfare of geowiki sites, they are considered an essential
human resource for many organizations, dealing with geospatial data.

Doubts and uncertainty on the authenticity and validity of the information and services contributed through VGI can be answered well through methods and measures suggested by this paper.

VGI has proved to be a boon in managing disasters. Volunteers from various VGI organizations have contributed significantly during natural disasters like hurricane Katrina, Haiti and Chile earthquakes. Volunteers from developed nations have shown their willingness to go and serve in developing nations which have very little and/or incorrect geospatial information, e.g. position or attribute data for failing infrastructure (wastewater and potable water).

IV. RESULTS

The motivational factors ranked list table:

<table>
<thead>
<tr>
<th>Factors</th>
<th>GISC Rank</th>
<th>OSM Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>To express humanitarian values (Altruism)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Personal satisfaction</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>To gain and improvise geospatial knowledge</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>To increase understanding on the matter</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>To build professional network</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>For strengthening social relationships</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>For better utilization of time</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Self-Promotion</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>To look for new employment</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>For reducing personal stress</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

Other factors are reasons like adventure, fun of working on new projects, for demonstrating the benefits of spatial information technology during disaster situations and improving the use of geospatial techniques in local governments.

Interesting Demographic Outcomes:

Sample Details: 134 GISCorps and 118 OpenStreetMap volunteers participated in the survey.

Location: Volunteers from USA, Germany and England dominate.

Gender: Female participation is less. [37% in GISCorps and only 4% in OpenStreetMap]

Age: All age groups contribute, predominant being those lying between 20-50 years.

Occupation: Majority (66-83%) of the participants are Professionals followed by the students and academicians.

Relation with GIS: GISCorps volunteers are highly skilled in GIS and they utilize their skills while volunteering. Whereas majority of OSM volunteers are less or unskilled in GIS and they volunteer as a hobby.

Volunteering Frequency: 46% of GISCorps volunteers volunteer on an annual basis whereas 45% of the OSM volunteers do so, on a weekly basis.

Volunteering Duration: More than 2/3rd of the volunteers have been contributing from years.

Software Products Used: Around 68% use commercial GIS softwares. They wished if these were open source then it would have been better.

Places Marked: Most of them mark streets and roads in the maps. It can be inferred that the present commercial maps lack the detail and accuracy for streets and roads.

Contributed Data Type: More stress is laid on spatial points, lines and polygons; hence the percentage contribution of you tube-link, wiki-link and photographs is very less.

Desire for Geospatial training: 50-60% of the volunteers want to undergo geospatial training only if it is free.

Participation Incentives: When asked what kind of participation incentive they desire the most; about 25% replied saying they do not need any and a considerable 26% desired for technical training.

Social & Professional Network: Majority of the volunteers have at least a single person in their social and professional networks who also contribute. This fact can be nurtured to bring more number of new volunteers on board and retain the existing ones.

Important Suggestions for Advancement of VGI:

Centralised Community for Volunteers belonging to a VGI organization/community/ project should be made where they can have knowledge sharing discussions.

Initiatives to bring more volunteers (especially females) should be made. More number of volunteers would facilitate validating the geospatial information before making it available to rest of the world. Thus content accuracy would increase.

Geospatial training should be provided for free to the volunteers .

Insufficiency of resources should also be worked upon, thus preventing the shying off of the existing volunteers.

REFERENCES

[1] The Motivations to Volunteer: Theoretical and Practical Considerations by Clary, E. Gil and Mark Snyder 1999
[4] UNDERSTANDING VOLUNTEERS’ MOTIVATIONS by Katerina Papadakis, Tonya Griffin and Joel Frater, 2004