

Involving Users in the Process of Using and Sharing Geo-information within the Context of SDI Initiatives

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SUMMARY

Considerable resources have been spent by governments on Spatial Data Infrastructure (SDI) initiatives since their inception. The potential of SDI is well known to Geographic information (GI) specialists and decision-makers, however, it seems there is a problem in communicating these potentials to the large group of possible users within the wider community. Involvement of users is crucial if SDIs are to be effectively implemented and utilized, particularly in the context of sustainable development. Previous initiatives in communicating the benefits to users, such as the classical top-down approach, have fallen short and hence need to be revised. Therefore the University of Melbourne, Australia and Wageningen University, The Netherlands cooperated to research how to better involve future users in the SDI-initiatives.

In the early stage of the research it was shown that an important issue of involvement is the lack of awareness. Up to now, most of the efforts were put in direct communication only to the known potential users. In the paper three reasons are given why a wider public should be reached:

- 1) to communicate the on-going developments of SDI and justify the invested resources to the wider public.
- 2) to make more people within an organization aware of SDI and increase the chance people are starting to discuss it.
- 3) to raise the awareness also within the social environment of the people that decide to invest in SDI.

Moreover, the paper gives some ideas how to raise the awareness of the wider public on SDI, using mass communication.

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1. INTRODUCTION

Worldwide initiatives have been taken to develop a spatial data infrastructure (SDI). SDI can generally be defined as the facilitation and coordination of the exchange and sharing of geo-information between stakeholders in the spatial data community. (Rajabifard, 2002).

Up to now, considerable resources have been spent by Geo Information (GI) -specialists since the first activities on SDI. Numerous successes have been booked to explore the potentials of sharing. Consequentially, a lot of governments are increasingly investing more resources on projects in this domain.

Next to that, GI-specialists have another important task; to involve future users of SDI in the SDI initiatives. Williamson (2004) for example, mentions that when developing SDIs, the trap easy to fall into is that SDI is only the infrastructure itself, however without users it has no justification.

Also the urgency of the involvement of users is high. The SDI cookbook mentions that the longer the harmonization of stand-alone databases is postponed, the more difficult it will be to make them interoperable. Costs for integrating stand alone systems into an SDI concept are increasing exponentially with time and the number of data sets. (Nebert, 2004)

Consequentially, numerous attempts have been made to better involve the users, though little had good output. Therefore University of Melbourne, Australia and Wageningen University, The Netherlands cooperated to research how to better involve future users in the SDI-initiatives.

In the early stage of the research it was shown that an important aspect of involvement is the lack of awareness. This is also one of the key factors to speed up SDI development mentioned by Rajabifard (2002).

Up to now, most of the efforts were put in direct communication only to the known potential users. This paper will discuss the importance of reaching a wider community and will give suggestions how to improve this.

2. GI COMMUNITY – CASE STUDY

To better understand users and their expectations it was decided to do a case study on one user community, and reflect the outcomes of this case study on other user communities. Emergency management community was selected as a more suitable community for our research purposes mainly because of different disciplines involved in this community. The other reason for this selection is that, this community invests a lot of resources in acting

transparent to a certain extent. This transparency is due to the fact that they are accountable to the public for the tasks they carry out.

To find information about emergency services, literature and expert knowledge was used. A wide range of literature was found dealing with the different aspects of emergency management i.e. fires, terrorist attacks, floods, storms and data capture after a disaster.

From this literature different stakeholders were defined. For every stakeholder the needs, opportunities and drawbacks were written down. Remarkably, in literature often these needs and opportunities were found, however without referring to which stakeholder they belonged.

The key outcome of this part of the research showed that the only stakeholders within emergency management dealing with exchanging geo-information are the government and the emergency management data experts. Emergency managers on the streets, media and civilians do not bother whether the information was shared or not. They mainly worry about the timeliness and user-friendliness of the offered geo-information.

This is the result when looking what the different stakeholders want for themselves when dealing with emergencies. However, a lot of previous research indicated that SDI can give great benefits to all stakeholders within emergency management by provision of good quality data.

The difference between the both train-of-thoughts is that the results from the case study are the direct needs. The gain of SDI for the emergency managers on the streets, media and civilians are indirect gains.

From this point of view, it is questionable if the awareness of all stakeholders needs to be increased on SDI, as some will not deal with it directly. On the other hand, media and civilians also have a second role in emergency management: they are the ones who criticize the performance of emergency management afterwards. If they are not aware of the on-going SDI developments in emergency management, they can not judge it properly. This awareness is necessary to communicate the justification of the investments of resources by governments.

3. SOCIAL STRUCTURE WITHIN ORGANIZATION

Knowing that SDI is not a product that is made to be sold, it might be interesting to compare it with the developments of the launch of a more general product.

How do the users of these products evolve? In general, embracing these new products take time as well. In the first period, only few people start using this new product. These people are often trying it for personal reasons, because they prefer using the latest gadgets or maybe are convinced of some potential benefits of the product. These pioneers are often referred to as the trendsetters. When those trendsetters experience the benefits of the product they are starting to demonstrate their surroundings these benefits. Consequentially, when the first followers are convinced of the gains, they start to invest in the product as well. Slowly, the awareness of the general public increases.

Especially, the first stage turns out to be crucial; to allocate the trendsetters that are convinced of the potentials and are willing to invest. To initiate such a process in SDI, there is an important bottleneck as implementation of SDI does not affect only one trendsetter but

mainly whole organizations, consisting of a lot of individuals, with both trendsetters and followers. The decision whether SDI will be implemented within an organization is made by a range of individuals within the organization.

By preliminary increasing the awareness of SDI already organization wide, the chance that the benefits and drawbacks of SDI will be discussed and analysed more intensively increases.

4. SOCIAL STRUCTURE OUTSIDE ORGANIZATION

It is important to realize that by far not all decisions made within an organization are started with something that is learned from experts or knowledge within the domain. Also external factors play an important role.

As organizations consist of a lot of different people, also the personal situation of these individuals is playing a role. For example, investing in new beamers could be mentioned in a discussion meeting because one of the persons within the organization saw this new type of beamer on his family day. This external factor, a family day, is not the criteria whether investments in beamers was made, however it was brought to table because of it.

Another example is the decision to invest in the creation of a new website for an organization. The reason could be because the son of the webmaster mentioned the interactive gains of certain software on the kitchen table during supper. Also here an external factor was the reason that a discussion for an investment started.

Concluding, also here investment in reaching a wider public is preferred.

5. MASS COMMUNICATION

At the moment only investment to raise awareness is being put in the known potential users of SDI. However, as mentioned earlier, there are three reasons that it is important to reach the wider community as well, namely:

- 1) to communicate the on-going developments of SDI and justify the invested resources to the wider public.
- 2) to make more people within an organization aware of SDI and increase the chance people are starting to discuss it.
- 3) to raise the awareness also within the social environment of the people that decide to invest in SDI.

It is hard to calculate the exact benefits for each reason. Nevertheless, investing in broader awareness can only give benefits as there are no disadvantages of reaching the wider public.

Reaching the wider public is best being done using mass communication. Mass communication is the spread of information by a small group to the wider public, using a transmitting device such as TV or Radio.

5.1 Common mass communication

The way of using mass communication to raise the awareness of SDI is important. It should be done both subtle and effective.

One of the most commonly used tools in mass communication is television. It is ideal to reach a lot of people that play an essential role in the involvement. It is not a problem that also people will be reached who will have nothing to do with SDI. That happens every day as well; think for example about shaving cream commercials. These commercials are not useful for the women TV watchers. Nevertheless, even they can play an important role in the decision to use the promoted brand.

On the other hand, it is not necessary to give all details on SDI to all TV watchers. SDI is quite a complex idea for people that are not familiar with spatial data.

It might be a good idea to broadcast a TV commercial with a lot one-liners that attract the attention of the watchers, and consequentially redirect the people to for example an exposition on SDI.

Optionally, broaden the contents of the exposition to other geo-information science disciplines such as GPS and Remote Sensing might increase the interested public. This way you inform all watchers about the availability of information. You give people who are interested in the subject the opportunity to go more deeply into it.

5.2 Tailor-made mass communication

Common mass media is already being used by a lot of organisations to reach the wider public. Next to the common method, it would be wise to think of a method in which the properties of SDI would play a larger part. Therefore, it was decided to think of a tailor-made way of mass communication to reach the wider public.

Nowadays, as the popularity of internet as a mass medium increases, a lot of companies started investing in publicity via the internet. For SDI this could also be a useful way to reach a large group of users. However, as there are already a lot of advertisements on the internet, a more appropriate way should be thought of.

Therefore, a list was created consisting of the properties of SDI

- SDI is about geo-information.
- The developers of SDI are not producers but enablers; enabling an infrastructure to increase the efficiency of others.
- SDI is promoted by the government as their goal is to give benefit to the general public is the main priority.
- SDI is being build not only for the developed, but also for developing countries.

One of the properties of SDI is that it is promoted by the government, as it is an infrastructure that gives benefits to the general public, and is not being developed to make profit. Therefore, it might be possible to use governmental websites to link to the SDI website.

Only creating a link on the governmental websites would not be sufficient as there is no reason for visitors to click on it.

6. BUILDING THE GEO-GAME

People like to be entertained. A modern type of entertainment are the on-line games. Often games or links to on-line games are sent around via e-mail to notify others, so the spread of the awareness of the games is enormous. Hence, the idea rose to build an online computer game on geo-information. Consequentially, during leisure time the gamers are confronted with geomatics in a light-hearted way. From there they can be linked to a website on SDI.

The game will be about the locations within the geographical region of the governmental website. The main goal of the game is quite simple. The screen shows the visitor a picture or asks a question about a specific location. Consequentially, the gamer has to find this location on the map as soon as possible. The idea is simple; the level of difficulty of the game lies in the level of the questions. If the game is created for for example the website of the City of Melbourne, a question could be “Where is Flinderstreet Station?” or showing the picture of it (Fig 1).

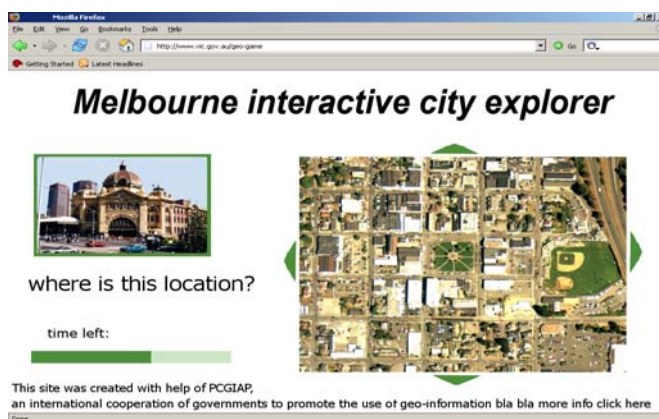


Fig 1. possible game for Melbourne website

Building a game for every different governmental region would take a lot of efforts. Therefore it is better to invest resources in building a wizard. This wizard could be developed by a GI-specialist community, such as PCGIAP, GSDI or URISA, and could be used by different governments. In the wizard they can choose the questions or photos themselves. They can also choose what kind of interface they prefer.

This wizard should make it possible to create an output (a game) within only a few steps. Basically, only in a few actions are needed (Fig 2). They are:

1. upload map / arial photo
2. insert contents
 - a. upload location photo or type in question
 - b. link location photo / question to map/arial photo
 - c. repeat step 2 as often as wanted
3. complete the general options



Fig 2. Only a few steps should be needed to create the game

With only one wizard a wide range of games are possible (Fig 3).

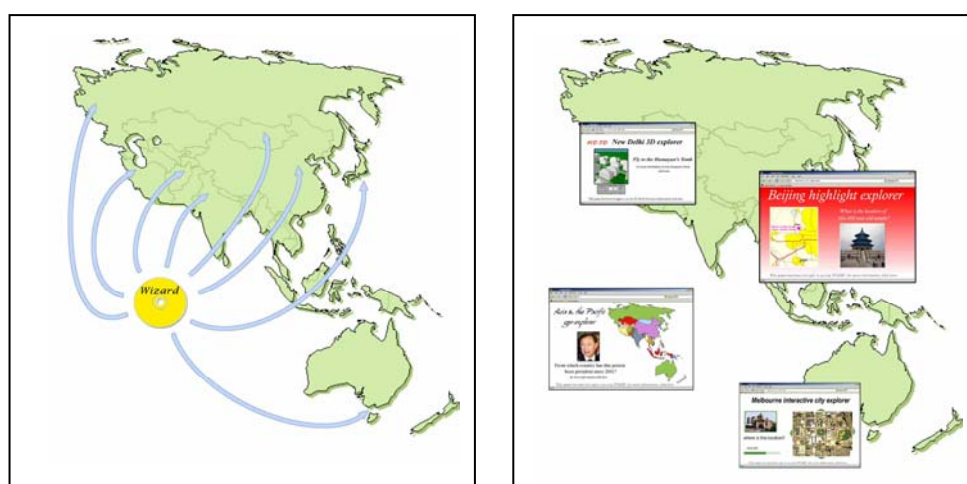


Fig 3. One wizard can give a lot of different outputs

The game is interesting for both government and visitor of the website. The government can show the strengths and history of the region, by thoughtfully choosing the questions. The visitor will be entertained by playing the game and will learn more about the region.

The advantage of the game for the GI-specialists is that within the output of the game they can add a link to their website. Figure 1 shows an example of an output, with in the lower part the link to for example PCGIAP. As shown in the example, in the bottom line, there is a small line about PCGIAP. If people want to know more about it, they can click on it.

Generally, the advantages of the game are:

- It will increase the awareness
- Evolving countries can also be involved.
- There is a clear link between the SDI concept and the game:
both SDI and the game are not built to create financial profit for the builders of it, but for the users of it.

- It will strengthen the social coherence of the region. (social factor of sustainable development)

Furthermore, there are a lot of opportunities for the game

- In the example only cities are mentioned, though it can be used for a large variety of different types of education as well.
- A high score table could be added (popular item of other sites)
- Questions should be easily uploadable via an excel file (user-friendliness)
- Besides the geo-part also the option should be made to easily build multiple choice questions about the city.
- Visitors could get the opportunity to switch between the arial photo and other layers, to orientate. This will off course make the resemblance with geo-information and referencing larger.
- Via de internet the option could be made to download templates, for a very small price. This way PCGIAP will receive money to hire good programmers and invest in new projects.
- The tool should be updatable via internet. In this way the contents of the information link to PCGIAP can be changed, but also errors can be filtered.

Off course a lot of other steps have to be added to make the game more playable (e.g. how much time is needed, how large should the arial photo be etc.). However, the tough programming behind the game should be included in the wizard as well as a very user-friendly help function, also showing how to put the game on the governmental website.

7. WHAT SHOULD BE COMMUNICATED?

It is important to have an idea what should be communicated on the website. As most of the people using the website are not familiar with geo-information, it is important to show the very basics as well.

SDI is quite complex for outsiders. It is already noticeable when people around you ask about the profession you are working in. It is often more easy to say that you're working on cartography than on SDI. Because, explaining SDI to a person that is not familiar with geo-information is like explaining the rule off-side to a person that has never heard of the game soccer. SDI is only understandable when the picture about geo-information and maps is right. There are also some common misunderstandings about geo-information, that should be dealt with on the website:

- **Term Spatial**
Unfortunately, the term spatial is still misunderstood by the wider community with many people believing it relates to activities or associated technologies in Space. Professionals in the discipline may refer to a community becoming spatially enabled. However, a part of the general public is not aware how geo-information and the associated technologies are supporting activities which identify street address, location and other everyday activities. (Williamson, 2004)

– **Misunderstanding geo-information versus SDI versus maps**

Geo-information is often confused with maps. Though, it is more than that. Maps are the printed outputs of geo-information. According to Kelly (1993) SDI is an infrastructure to exchange information.

- It exist to support other economic or social activities, not as an end in itself
- It incurs a relatively high initial capital cost
- It has a relatively long life. So, it requires long-term management and commitment of funds.

– **Misunderstanding SDI is a computer tool**

People think that SDI is just a computer tool to exchange data. However, this idea is wrong. SDI as the word says is an infrastructure, just like other infrastructures build by governments. For building roads one needs tools, like steam-rollers. In that perspective should the computer tools be seen as well.

– **Misunderstanding SDI is a Geo-Information System**

The same mistake is made by saying that SDI is a Geo-Information System. That is not true, they are just strongly related. Because, an essential part of geo-information systems is its geo-information. And this geo-information could strongly support an SDI, by contributing its geo-information to the infrastructure.

Besides these very basics about geo-information, it is important to show the activities in SDI that are taking place worldwide. Besides that, the urgency of involvement should be met, by lowering the threshold to participate in the SDI initiatives.

8. CONCLUSION

The lack of awareness of SDI is an essential bottleneck in the involvement of users in the SDI initiatives. To raise this awareness, not only the known potential users should be focused on, but also the wider community. This paper discussed the importance of this issue and reviewed presented different channel of communications. It has been found through this research that the most common way to raise the awareness of the wider community would be the mass communication. This could be done using traditional types, but also using the latest types of mass communication.

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BIOGRAPHICAL NOTES

Floris de Bree holds his BSc in Landscape, Planning and Design and is currently working on his MSc Geo-Information Science, specializing in SDI.

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