Towards a participatory community mapping method: the Tilburg urban farming community case[1]

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Abstract. Urban farming communities often consist of many disjoint initiatives, while having a strong need to overcome their fragmentation. Community mapping can help urban farmers make better sense of their collaboration. We describe a participatory community mapping approach being piloted in an urban farming community-building project in and around the city of Tilburg. The approach combines (1) a basic community mapping language, (2) a state of the art web-based community visualization tool, and (3) a participatory mapping process to support the community-building efforts. We outline the approach being developed and present initial results of applying it in the Tilburg case.

1 Introduction

Urban farming is an upcoming movement around the world, aiming to foster the practice of cultivating, processing, and distributing food in or around a village, town, or city. Characteristically, urban farming initiatives are small in scale and disjoint. However, urban farmers have a need for being involved in and empowered by engaging, informal practices that lead to the creation of viable tools and processes underpinning community practice (CITIES Foundation 2012).

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A project was started to intentionally strengthen and connect local urban farming communities in the Dutch southern province of Noord-Brabant. One subproject in and around the city of Tilburg concerns creating a participatory community mapping method to (1) let the emerging urban farming community make sense of itself and (2) use that increased awareness to strengthen the community building process. Constructing and testing a first version of the mapping method took place in the period September 2014-June 2015. In this paper, we describe preliminary results on constructing and applying the method in the case of the Tilburg urban farming community.

2 Participatory community mapping

There is a multitude of definitions of community. Whereas communities used to be equated with traditionally tribes and villages, they are now more broadly seen as sets of relationships where people interact socially for mutual benefit (Smith 2002), often supported by online technologies to mediate their communication. Not all communities emerge spontaneously. When new communities are forming in uncharted territory, as in many urban farming cases, effectively and efficiently catalyzing this process of building a meaningful network of relations and interactions is of the essence. Their growth can be catalyzed and facilitated, although not forced, in a process of community-building.

Community-building is an iterative process in which community members increasingly become aware of what binds them, while that increased level of awareness in turn can inform and trigger new community building activities. For instance, in the well-known Cultivating Communities of Practice methodology, such activities as "building connections between core group members", "finding the ideas, insights, and practices that are worth sharing", and "identifying opportunities to provide value" are key when coalescing a community (Wenger et al 2002).

Such community-building exercises are examples of sensemaking activities. Sensemaking is an ongoing retrospective development of constructing plausible images from a social context (Weick et al. 2005). Formalization of sensemaking efforts helps to reduce ambiguity and to create common foundations for collaborative action (Vlaar et al. 2006). For communities, such formalization is not about abstract representations and algorithms. Instead, to support their sensemaking efforts, communities need languages to express and contest perspectives in principled ways. Furthermore, they need – Web-based and other - tools that are flexible enough to mediate, capture and add value to discourse between stakeholders, yet provide light-weight structure and computational support (Shum 2006).

A core communal sensemaking activity is community mapping: originally a cartographic exercise to map the geographical connections and common ground that local communities share. Such community mapping is an empowering learning and planning process, facilitating the storytelling of communities (Lydon 2003). However, community mapping has expanded beyond the

geographical domain. Another form concerns knowledge mapping, for example providing visualizations of argumentation and conversations (Shum 2006). These approaches focus on making sense of what communities talk about. A third main class of community mapping languages, tools, and processes are grounded in social network analysis methods, e.g. NodeXL (Smith et al 2014). Their focus is on what the community is and how its members interact.

Maps using a visual language in their representations have power, both by what they depict and what they leave out. Geographical community mapping methods stress strong community participation in the map making process. They focus on what people value and envision for the future, and are the antithesis of expert-led development (Lydon 2003). Knowledge mapping is also increasingly interested not only in the language, but also the process of how the knowledge gets captured. For instance, the field of "knowledge cartography" is just as much interested in how to engage participants and build meaning in a group as they are in the knowledge representations themselves (Selvin and Shum 2014).

Our focus, therefore, goes beyond producing meaningful and legitimate community maps per se. Our challenge is how to develop a participatory community mapping method that not only makes sense of the current state of the community, but also uses the maps to inform active community building efforts. In other words, how to weave the community mapping language, tools, and process through an iterative process of community-building?

Next, we outline our evolving participatory community mapping method which aims to address these questions.

3 Participatory community mapping

Ours is work in progress on a participatory community mapping method. The method is developed iteratively by refining and extending our community mapping language, tool use, and process. To this purpose, intermediate versions are presented to the community and its feedback is processed in the next version.

3.1 The mapping language

The mapping language needs to distinguish between *elements* (depicting socio-technical concepts of the community network) and *connections* (representing relations and interactions between those elements).

3.1.1 Elements

Based on earlier work (De Moor 2013), we distinguish the following elements:

- Participants
  - *Persons*
  - *Organizations*
  - *Communities/Networks*

o   *Roles* (to be played by participants, e.g. "Student")

- *Activities* (dynamic process outcomes, e.g. "Organizing an Exhibition")

- *Results* (tangible, static outcomes, like "Exhibition Stand" and "Report". Activities are outcomes as well, but being *processes*, they can also generate other processes and results and are a direct source of community building).

- *Tools* that can be used to support activities.

    o   *Physical Meetings* (e.g. "Bi-Lateral Meetings", "Network Meetings", "Presentations", "Conferences").

    o   *Online Tools* (e.g. participant websites, social media such as project apps, Twitter, Facebook).

3.1.2   Connections

As we have seen, communities are networks of relationships and interactions for mutual benefit (Smith 2002). Carroll and Rosson (in Caroll 2012, p.15) define a conceptual model of community consisting of collective identity, local participation, and diverse support networks. Four composite variables for community membership and participation can be mapped to the constructs of this model: Belonging (identity), Informedness (passive participation), Activism (active participation), and Associations (support networks) (Carroll 2012, p.90).

Building on their approach, we identified four types of connections to capture the root types of community relations and interactions. They are ordered in increasing degree of participant involvement:

• *Informedness* (being informed about activities of the community, but not being part of it)

• *Associations* (being an explicit member of the community in the sense of having made a commitment to participate)

• *Participation* (actual participation in the activities of the community)

• *Producing* (producing visible, measurable results as outcomes of the activities. This is the most involved kind of participation).

Note that we have not yet addressed the Belonging-construct, as our first priority was to make sense of the externally observable relations and interactions.

3.2   The mapping tool

Our mapping tool needs to be able not only to effectively visualize the connections between the elements, but also to afford various perspectives on the map. These perspectives are relevant to different sensemaking and community-

building needs of the community members and the network of stakeholders around the community. To this purpose, we chose Kumu[2].

Kumu is a web-based tool to track, visualize, and leverage community and network relationships. Kumu maps consist of elements and connections between the elements. Elements can, for instance, be visualized by their own colors, icons and sizes, and connections by the combination of color and width of their lines. For example, we represent *Informedness* by a thin blue line, whereas *Producing* is shown as a thick red line, indicating its much more involved community-building contribution.

On the map, one can define different *perspectives*, in which Kumu only shows those elements and connections of interest in the way desired. To define perspectives, one can apply specific *decorations* as well as various kinds of foci and filters. *Focus* allows one to home in on certain portions of the map. *Filter* is used to select which elements and connections should be made visible.

For example, a focus can be created for a specific participant or activity, showing only the direct (first degree) connections on the map. The resulting perspectives can be shared through customized hyperlinks. Such a link may be of interest to community members to see and share their specific role in the overall project. One way to use this option is for them to add that link to their own web sites, Facebook pages and LinkedIn profiles.
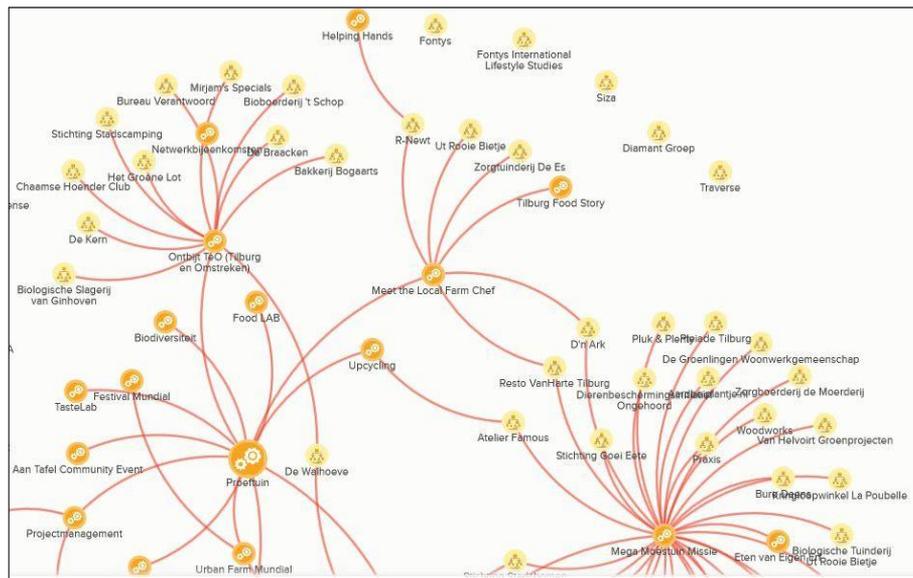

Figure 1. Applying a filter to the community map: showing in which activities the involved organizations participate.

An example of how filters are used in our community is to show the community managers which organizations are participating in what activities.

This means going to the Filter-menu and selecting the *Organization* and *Activity*-elements, as well as the *Participation*-connection between them (Figure 1). Another example is to use a filter to see how *Activities* and *Results* are related through the *Producing*-connection. This is a useful way for community managers to see "isolated" *Results* which do not have a producing *Activity* linked yet[3].

3.2.1   The mapping process

Making the community mapping process participatory, implies maximizing the involvement of the community members in three sub-processes: capturing the data, interpreting the map and using the map. These sub-processes are still under construction. Here we share some of our initial lessons learnt so far.

3.2.2   Capturing the data

Making maps is an expensive process, time and quality control-wise. Ideally, participants update their own data directly. However, tool functionalities are complex. Learning how to use them has a considerable learning curve. Also, it is easy to "break the map". When editing the map, the inadvertent cutting of map branches can easily occur, for example. Therefore, a dedicated map maker-role has been assigned. The map maker prompts and collects the data from the community members, and gives them relevant feedback, for example the links to their own participant and activity perspectives.

One important issue, to be confronted up-front in any participatory community mapping method, is to find the balance between map completeness and feasibility. Ideally, all participants, activities, results, and tools are modeled at the greatest level of detail. Customized perspectives can then reduce complexity and provide the most relevant viewpoints. However, in reality, map makers' and community members' time is limited. Trade-offs can be made in, for example, frequency and granularity. Only quarterly "official" map updates are made for our community, for example, with inofficial intermediate updates in between as time permitted. As to granularity, initially, the idea was to model all participants, including the individual persons involved. However, this was not feasible, given the numerous people taking part, often on a temporary basis, in the many urban farming activities. The procedure was then changed to just model the organizations, and only represent persons when they were participating on an individual basis.

One practical issue in any community sensemaking project is how to motivate members to contribute and reflect upon their data. One approach used with the Tilburg urban farmers is to make it an add-on to regular project reporting responsibilities. Their regular progress reports contain a special section with map-focused questions. However, preferably, more intrinsic motivators are used. One way to do so, is by communicating and reflecting upon the map at regular project

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[3] To see more background on the project, the full map and examples of various foci and filters, see http://bit.ly/1LBoVAu

meetings. What we found is that community members responded very strongly to "their map" being shown: first off all that they saw the map as a whole ("Finally, I see the big picture!") and secondly, a better understanding - and being proud of - their own role ("Cool to see how I am connected!"). Interestingly, quite a few members whose participation was not modeled sufficiently initially, supplied additional data after those communal meetings on their own initiative.

3.2.3 Interpreting and using the map

Three main roles are involved in the community mapping process: map makers, community members, and community managers.

Given the complexity of the mapping language, tool, and process, map making is not a trivial activity. So far, the map making has been done by the author. However, this is not scalable in the long run. Ideally, community managers or members are trained to become map makers. Various levels of map making literacy can be distinguished. The overall structure, layout, and functionality of a community map could be created by a "master map maker". Then, selected community managers/members could be trained to expand the partial "domain maps". They could focus on adding "more of the same" participants and activities, for instance, and filling out the data fields of the various elements and connections. This is another example of a trade-off between completeness and feasibility.

For community members, the main reasons to contribute to and use the map is to see the bigger picture as well as their own role in the community. For interpretation, particularly the overall birds'eye view of the whole map, and the direct perspectives (one degree of separation) on their own *Participant* and *Activity* focus-views have turned out to be useful.

For community managers, we have identified two main usages of the map: community management and accountability.

An example of management support is the filter view to identify "isolated results", mentioned in Sect 3.2. Such perspectives could help community managers start conversations with those responsible for the results to see what activities are needed to get them accomplished. Also, from the bird's eye view one can see which participants are hubs and who are at the periphery of the overall community network. This, for instance, helps community managers in setting the agenda for the next round of community activities by connecting "loners" to centers of activity. Interestingly, using the map also seems to increase the "self-management" of participants, as demonstrated by their voluntary submission of additional data. This may be explained by a developing sense of community as more relations and interactions evolve.

An unexpected usage mentioned not only by the community managers of the Tilburg urban farming community, but also by managers of other communities and networks we shared this with, is that of accountability. Many community and

networking projects have a problem to justify the resources spent on their initiatives, for example to their sponsors. Typically, such projects are evaluated on deliverables (the "Results" in our list of elements). Community maps like produced here help to show what arguably are the most important deliverables of all: the sustainable, lived network of relations and interactions making up the community network.

4 Discussion

We outlined preliminary results on the construction and application of a participatory community mapping method. Work is underway to mature the method by expanding and integrating the mapping language, tool, and process.

In the mapping *language*, the Belonging-construct (identity) in the community membership and participation model used (Carroll 2012), is not incorporated yet. Adding questionnaires in future map building iterations could help tackle this. To further expand the mapping language constructs and the so far only informal, visual analysis, further inspiration could be drawn from community and social networking theory and methods. For example, community bridges are community members who participate in more than one group through acting as strong ties (Caroll 2012, p.107). Also, our method could be enriched by finding ways to combine our social network mapping constructs with knowledge mapping constructs, like the actual types of conversations community members are involved in. A good case in point are community clusters: multiple topic conversation centers of activity around a few hubs, which are at the heart of community formation (Smith et al 2014).

Tool-wise there are other Kumu features that we intend to explore, including the (basic) social network analysis functionalities built-in. To extend that functionality, it might be worth using more advanced social network analysis tools like NodeXL[4]. Whereas Kumu focuses on empowering communities through its Web-hosted maps and advanced user interfaces like perspectives, NodeXL offers a more in-depth analytical toolset. Another direction we aim to explore, is to see how Kumu fits in an "ecosystem" of social media tools. One could e.g. use Twitter and Facebook to announce map changes and include links to particular perspectives in "meta-communication" about the maps like referral links from websites and mentions in organizational newsletters.

As to the community mapping *process*, the focus so far was on data capturing for map construction. The interpretation and usage of this data, however, is where the real community building happens. Using technologies like online maps for such active community-building purposes requires active participation of community members and managers, in various kinds and degrees. One resource

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[4] http://nodexl.codeplex.com/

for developing the operational and governance roles required, could be the Reader-to-Leader framework (Preece and Shneiderman 2009). The framework shows the detailed usability and sociability issues to be taken into account when getting people to participate more intensively in online social activities.

Our process-method has so far consisted of a number of researcher interviews with key community members and managers, plenary community presentations, and the collection of map data through a form-based questionnaire and individual follow-up mails. We aim to make it more community-driven by taking cues from proven participatory design methodologies. The oldest form of community mapping, geographical community mapping, has many practical lessons to offer to make it mapping *by* instead of for the community, e.g. breaking down categories of maps and special workshop formats (Lydon 2003). Also, knowledge mapping is getting serious about participation: away from abstract representations to "knowledge art": developing the human skillset needed to use digital (and non-digital) artifacts in real time to engage participants and build new meaning in a group (Selvin and Shum 2014). Finally, we aim to take cues from participatory socio-technical systems design approaches like the "Socio-Technical Walkthrough" (Herrmann 2009). It offers procedures for developing, evaluating, and improving diagrams of socio-technical systems, of which community maps could be an example.

5   Conclusion

We outlined preliminary work on a participatory community mapping method being piloted in an urban farming community case. Community mapping is a powerful instrument for community sensemaking and building. Many sophisticated representation techniques have already been developed in community mapping disciplines like social network analysis and argumentation mapping. However, to make such techniques optimally benefit real-world community building processes, they must be made more participatory. To do so, community mapping languages, tools, and processes need to be calibrated and aligned, so that they can best serve their particular communities. Much work still needs to be done in figuring out how to best design such socio-technical methods. With our approach we hope to make a contribution to this growing community-mapping, -sensemaking, and -building body of knowledge.

6   Acknowledgments

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