

# Open GeoSpatial

## Research Questions On A Collaborative Entrepreneurial Enterprise

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Just as the internet boom caused an explosion in capitalistic entrepreneurial activity, it also made possible entrepreneurial activities with a decidedly social bent. The most important and visible of these is what gave rise to the internet in the first place — open source software and data. These open source social entrepreneurs are engaged in what can be best described as collaborative knowledge production. While the internet is its prime catalyst, a confluence of factors such as altruism, showmanship, anti-establishment sentiment, as well as plain pro-community and sustainability sensibilities is driving this entrepreneurship.

The geospatial field has seen increasing collaborative activity in the past half decade. While the public domain GRASS project has been around for 25 years, advent of MapServer, ShapeLib, OpenJUMP, GEOS, PostGIS, etc., has made open geospatial increasingly popular. Entry of non-traditional GIS companies such as Google (Maps), Yahoo! (Maps), and Microsoft (Live) in the spatial web space has brought mapping to the front of public consciousness. Most exciting, however, have been the projects dealing not with computer source code but with data. Such projects include Open Street Map and many other GIS/GPS data efforts. Of course, source code is data as well, albeit a very special kind of data that make sense only to programmers. Those who write source code could care less about the data produced with that code. Likewise, those who produce data would just as well not have anything to do with the code that produced it. But both participate in creating data collaboratively. Since data are a significant component of knowledge, collaborative data production is leading to collaborative knowledge production.

Collaboration is a symbiotic relationship among its participants — those acting in their own self-interest help everyone else in the project as they report a bug, create a patch, add a new feature. This is a classical cooperate-cooperate behavior in the game-theory sense. Active participation in the project also leads to social benefits such as visibility, credibility, and status. But, while its success is indisputable, collaborative knowledge production as an entrepreneurial activity invites several research questions as presented below.

Collaborative projects, like all entrepreneurial projects, are successful when they are able to return to their “investors” what they set out to achieve. In traditional entrepreneurial projects the motive is to get rich. Investors in collaborative knowledge projects, however, can have a variety of motives, so everyone seeks different kinds of returns. Some are satisfied when they have a working implementation without having had to pay licensing costs, others feel the glow from peer recognition. Still others might be rewarded with a concrete recognition in the form of a citation or an award. If the returns are so varied, entrepreneurship becomes difficult to discern. *Are participants in collaborative knowledge production entrepreneurs?*<sup>1</sup>

Participants of such projects come in many shapes and sizes — individual hackers, employed skunk-workers, hobbyists, small firms, very large firms, academic institutions, and governmental and non-governmental agencies. The level of analysis for this activity is the network, as such knowledge production can't exist without a network. Entrepreneurial activity ranges from the individual to the corporate level. Open source activity fits none of the expected slots. It really is a collaborative activity, and hence, needs to be studied at the collaborative level. The “unlimited” nature of the internet, of course, poses its own research challenges. *Does their collective resemble a firm or an organization from the organization theory point of view?*<sup>2</sup>

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<sup>1</sup> Patricia Thornton defines entrepreneurship more widely than traditionally understood, and thus, provides a good starting point for literature study in this area. See Thornton, Patricia H. 1999. The Sociology of Entrepreneurship, *Annual Rev. Sociol.* 25:19-46.

<sup>2</sup> Katz, J. and Gartner, W. B. (1988). Properties of emerging organizations, *Academy of Management Review*, 13, 429-441.

## Specialist Meeting on Volunteered Geographic Information, NCGIA

Collaborative projects start off disorganized, but as they evolve, they move toward organization, the most successful ones getting institutionalized typically as a foundation. Organization is a double-edged sword. Volunteerism is an important component of a collaborative project, but successful projects need financial support, usually in the form of sponsorships for conferences, printing and publishing, and a minimal level of full-time staff. A foundation is able to attract support, but can't have major financial backing as it has to maintain its independence and non-profit standing. One solution is to attract funding for targeted development — someone wants the software to be able to do “a particular thing,” and is willing to pay for the development of that particular capability. The result is usually put back into the commons for public consumption. Understanding this evolution of collaborative projects and the paths and forms that lead to greater stability, continued participation, and continued evolution of the product would be useful. *Is organization a logical Coase-ian evolution<sup>3</sup> for collaborative projects?*

Quantifying volunteer effort on the part of everyone from the lead developers to those who spend time on mailing lists helping others is very difficult. Being able to convert this to a financial amount may help “capitalize” the effort, and in turn, attract sponsors as well as become more attractive to those who are traditionally suspicious of anything “free.” *How can volunteer effort of participants in a collaborative knowledge project be quantified?*

In the tech world, the number of startups that are successful is tiny compared to their total number. For each successful startup, there are several times as many that fail. The open source world experiences a similar Darwinian selection. For each open source project that does become successful and manages to gain traction, many times as many fail. Freshmeat, the online repository of open source projects, lists 43,505 open source projects, and has almost ten times as many users. But only a small percentage of these projects have become successful. *Is this activity a legitimate part of capitalism in a Schumpeter-ian sense?<sup>4</sup>*

Collaboration thrives in a set of conditions including open and free access to data, source code, and expertise made possible by an information infrastructure commons that may be publicly or privately funded. Public policies are critical in galvanizing collaboration as they provide the networks, the licensing framework and the baseline data (open access to public sector data), and start-up and on-going expertise. My work this summer at the National Academies has motivated me to study the role of public policy in collaborative entrepreneurial activity. Later this month I will attend a workshop organized by Science Commons, CODATA, and the Global Biodiversity Information Facility in Paris on “Common Use Licensing of Scientific Data” from the point of public sector agencies. Public policies can encourage innovation through investment in software and data that are then provided under open and non-restrictive licensing, by encouraging anti-competitive practices and enabling the public infrastructure on which innovation can take place. *What is the role of public policy in facilitating collaborative knowledge production?*

I have been working with the Open Source GeoSpatial Foundation (OSGeo). I am an elected Charter Member, and Vice-President and Chair of OSGeo's Education and Curriculum Committee. Most of the activities at OSGeo are volunteered, but financial support is sought for a few, and such support leverages and complements volunteerism. OSGeo enables many other traditional entrepreneurial firms that combine profit-seeking business with volunteered collaborative knowledge production. OSGeo provides me with a living laboratory for studying collaborative knowledge production as an entrepreneurial activity. I am also complementing my research with a minor at the University of Wisconsin Business School under the Initiative for Studies in Technology Entrepreneurship (INSITE). The VGI meeting will provide me with invaluable feedback on my research direction, and enable me to contribute to this important scholarship.

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<sup>3</sup> Coase, Ronald H. (1937). The Nature of the Firm, *Economica*, 4, (16), 386-405.

<sup>4</sup> Schumpeter, Joseph. (1950). *Capitalism, Socialism and Democracy*, New York, Harper Torchbooks.