

See also [Sensorica-NRP software project summary](#)

*Feel free to start at the end or wherever the spirit moves you. And maybe include your name with your comments. (optional, but might make things more clear)*

## **Focus**

*The focus of this summary is Sensorica as it was originally formulated: an open value network that would become economically sustainable by making sensors for sale on the market, where the income would flow to the contributors according to their relative contributions, using a democratically decided value equation.*

## **Observations**

*What led up to and fed into the crisis? Facts as you saw them.*

### **Bob Haugen**

Since I was too far away to have enough reliable observations on a couple of critical issues, I'll ask some questions.

#### **On the goal of economic sustainability:**

\* Did either of the main products for sale (Mosquito and Mantis) ever meet the quality standards of their prospective customers?

\* If not, why not?

\* If so, how many actually sold? For how much income?

\* What other factors played into the market success or lack of success of Sensorica's sensor products?

#### **On the Open Value Network model:**

\* To what extent did the main contributors to Sensorica agree or disagree with different aspects of the model? (For example, Open, Peer-to-peer, etc.)

\* Did the main contributors have different and incompatible values? From the beginning? Or did differences in values emerge later, or at the point of crisis?

\* What issues were raised, and how were they handled?

\* Were the disagreements ever resolved?

**Tibi**

A *value system* of the scale of SENSORICA is already is a [complex dynamical system](#). There are many interrelated processes that lead to a complex behaviour. This is to say that it is hard to find proper causal relations, but at the same time, this is also part of the problem. It is part of the problem because different individuals (main contributors with greater influence) have different convictions in terms of what needs to be done to the value system in order to have it migrate towards a certain state. For long time, I sensed that we were better aligned on goals than on the process to get there. Since the system is complex, no one can really demonstrate that a given set of actions will lead to a given state. Therefore, the solution is to try, fail, try and fail again, until we get it. But as Kurt likes to say (quoting a friend of a friend), SENSORICA doesn't have the luxury of time to evolve, some planning and wise allocation of resources is required, therefore some agreement is required before the problem gets too big.

I'll enumerate some elements that I think played a dominant role in establishing the dynamic that lead to the crisis. But I am sorry, I cannot demonstrate anything. I rely on my own experience and on my proximity to the network.

We are **late to market**. In other words, we are not generating enough revenue to sustain ourselves from the value we create. In general, based on my experience with open networks, this leads to **project fatigue**. In a gift economy people would just leave and do something else. SENSORICA binds people more strongly, because it is mostly about generating tangible benefits and some of us who contribute a lot are invested in different projects. So people can't just leave, they want to collect the fruits of their work. They stick around and try to impose their views, based on what they believe will lead to the pay day, sooner rather than later. So this **stickiness** holds people together and if there is a disagreement they will stay to fight for it. In my opinion, the lack of stable revenue created **skeptics** about the OVN model. These skeptics tried to imagine solutions to the problem, and one perceived solution was to attract classical investment. The problem is that classical investment and the OVN model are incompatible, if the **investors** don't buy SENSORICA's [fluid equity](#), respecting the *value accounting system* agreement.

Therefore, there is a need to **change the way SENSORICA functions** in a manner that alters its fundamental values and principles. But not everyone agrees on the roots of the problem (because the system is dynamic and complex, it is hard to demonstrate something through argumentation), and some of us, including myself, believe that we could have avoided being late to market. Since some of us believe that the problem could have been avoided while maintaining our core values and principles, some of us believe that there is no need to bring investors in right away. Therefore, these believers, including myself, oppose these changes prescribed as a solution to the problem, since we see other types of solutions. So the system migrates towards a **fork**. The crisis started with a decision on the use of **SENSORICA's brand name**. In fact, the real question was about transforming SENSORICA or, if there is too much resistance, to

create a different structure, the fork, and call it SENSORICA+something. In the case of the fork, since the changes proposed were quite important, calling two very different things SENSORICA would do no good to neither of them. Anyone who understands this understands that the real solution is not just a fork, but a transformation of an entity into another one, since both cannot exist with the same brand name, or the creation of a different entity, with a very different name. The later option prevailed.

Can **governance** solve this kind of problems? Not really... If a voting system is applied to this problem you also create winners and losers, i.e. happy people and sad people. Consensus cannot be applied to this, because the system is complex and no formal demonstration can be made based on rational arguments. Consensus would take a long time and would require experimentation, which is a no go in the context of project fatigue.

Another problem that I see, is that we spent too much time pursuing classical funding instead of focusing on alternative funding. We've never done a crowdfunding campaign! This put us in a situation where we focused less on initiatives that were closer to our nature, creating a distance from our nature and core values.

Moreover, we spent too much time reinventing the wheel instead of looking for solutions and do more integration and building bridges with other open source communities.

## *Main Problem*

*Pose the main problem. Every system has one main problem at any one time. When the main problem is resolved, the system moves to a new state, where of course a new main problem emerges.*

*Secondary problems may also exist, but resolving a secondary problem will not resolve the main problem.*

### **Bayle Shanks**

i actually think the crisis was the convergence of multiple issues with no dominant "main problem". At the end of this document, i posted some recommendations that show what i think some of these issues were. --

### **Tibi**

If you allow an attempt for causal argument:

- **lack of open culture** (understanding that SENSORICA is an open organization, a locus of coordination and facilitation, which gathers most of its resources from the environment - be open, transparent, socialize work, leave traces and use different attachment mechanisms for stigmergy to kick in and the long tail to get established), which leads to

- **reduced capacity** and **low redundancy** (not enough people who can perform the same role and not enough resources) which leads to
- **delay to market**,
- which leads to **project fatigue**,
- which leads to the **urge to change things**,
- which leads to **fork**

## Analysis

*Analyze the observations as they relate to the main problem. Your analysis may lead you to re-assess the main problem.*

## Methods of correction or solution

*Correction means practical steps to improve the situation so things can move forward. Solution means to resolve the main problem and move the system to a new state.*

### Tibi

My focus is on

1. Cultivate an open culture
2. Put in place processes that allow different kind of resources to flow into the network
3. Put in place mechanisms for capture/accumulation

1. Is the most difficult problem of open p2p networks. Lack of open culture manifests itself in many ways.

- People don't understand **why transparency** (in terms of access to information) is needed, therefore they don't generate traces (ex. documentation), don't signal needs/wants and success stories, no stigmergy.
  - People don't like to share early, because they fear criticism (**one solution is to signal are not punished, encourage risk taking, reward lessons learned and implement solidarity mechanisms**)
  - People are afraid to share openly because they fear that they will be copied and that someone else will occupy their niche (**hard to solve, requires a proof in practice that SENSORICA innovates and delivers fast**)
  - People don't like to socialize their work - put results and problems on Facebook, Youtube, blog about their work...
- People don't understand **why openness** (in terms of participation to projects) is needed.
  - There is a natural tendency to monopolize activity, because in general people like to feel that they are indispensable. If someone else comes in and can do the

same thing we become less important, dispensable. (one solution is to surface and acknowledge positive contributions, to give positive feedback, this is in the social space)

- People think that if others come to contribute to the same project their share of the pie will be diminished. (the counter argument is that things get done more rapidly, people get some rewards and move on the other projects)
- People want to be singled out and associated with victories, not to be diluted by a co-creative process. (formal reputation and role systems can take care of that, rituals for recognizing involvement, achievement)
- People don't really understand the meaning of an **open organization and abundance**
  - When we need a resource people tend to look within their proximity, "inside" the organization. An open organization gets its resources from its environment. Everyone's reflex should be to look "outside" for resources of all kinds. (this requires heavy use of social media, socialization of work, incentivise finders and connectors, get out there, create events, outreach, use of crowdfunding)

The fact that we focused more on classical funding and not at all on crowdfunding, or other alternative funding techniques is also linked to a lack of open culture.

Moreover, we spent too much time reinventing the wheel instead of looking for already made solutions, do more integration, and building bridges with other open source communities. We innovated like a startup, not like an open source community.

2. Is more technical and can be dealt with more easily.

- Our **content management** tools have become non sufficient for our size and complexity. (we need better website/content management tools, better project pages)
- Our **planning** tools in the NRP-VAS are not mature enough (improve the planning and project management tools, export needs in different locations, allow anyone in the world to easily contribute - an issue has been created on Github).
- **Access** to value creation is not easy. (allow anyone in the world to join SENSORICA without someone's intervention, as easy as creating a Facebook account)
- **Integration** within the network is hard. All dynamic p2p networks are not legible, because they are fluid/dynamic, which makes it hard for new affiliates to orient themselves within the network. (implement the formal role and reputation system, add signaling in the virtual and physical spaces, create a support role as "guide" and reward it well)
- Automate **integration with social media** to diffuse needs/wants and success stories within well-targeted online communities. (needs some web development!)
- ...

3. Is partially about rules, partially about culture, and partially about tools. Capturing mechanisms insure that the potential of the network and the value it offers to people increases over time.

- Affiliates need to **contribute to the commons** while they are active within the network. This means that they need to document their work, share their designs, processes, etc with the network and with the rest of the world. (see [cultural issues above for solutions, and create stronger incentives for documentation](#))
- We need to implement **rules for access to resources**, and some of these rules need to go in the favor of increasing the commons (see [rules for Montreal lab that I initiated](#))
- ...

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### **Questions to ask yourself:**

*Could the crisis have been avoided? Or could it have been resolved in a less-antagonistic manner?*

**Tibi**

The crisis could have been avoided. Instead of trying to change people's culture we had to bring in more people with the proper culture. In order for this to happen we need to tune the way we communicate about ourselves, to be very careful about what we project about SENSORICA, in order to create the proper attractor. We also need to better reward roles related to outreach, communication, etc.

But this is not the first nor the last crisis. As we grow in size and complexity other crisis will follow. Sometimes a crisis can be anticipated but the solution can only become apparent to everyone only after the crisis. Sometimes the crisis can develop without obvious signs. **We should NOT fear crisis.** It's part of the process. This document is also part of the process, learning for crisis.

*What is the state of Sensorica now? Maybe some people already went through this cycle in their own ways, decided what they thought was the main problem, and took action.*

**Tibi**

SENSORICA is already an attractor, beyond its critical mass. It has very good chances to recover and to prosper. But we need to generate revenue fast. We need to demonstrate in practice that the system works, that people can actually make a living from their activities within the network.

When I came back from Europe, people were disoriented and the focus was lost. There were no meetings on projects, priorities were lost, there was no long-term planning, everything seemed precarious. People were hanging in there, but their investment in the community was greatly diminished (signs of insecurity with respect to the system). The focus was more individual. A month after, I see a beginning of change in focus. More sensoricans are starting to align their actions to save the network, to reinforce its foundations.

*Now the same people appear to be working in the same lab together. Nothing appears to have been changed very much. So have practical steps to improve the situation been taken? Has Sensorica moved decisively to a new state? Or has it failed to move to a new state, and the problems have not been improved, either?*

**Tibi**

We are taking very concrete steps to strengthen the basis of the network. More and more people help the cause. If our new initiatives are successful we should see positive changes within a month.

- We are untangling some legal issues. ACES/CAKE Canada (non-for profit) is becoming the official custodian of SENSORICA with a bank account. This will allow us to do crowdfunding for space, projects, infrastructure development, etc.
- We are implementing lab rules.
- We are working hard on crowdfunding (for the NRP-VAS, 3D printer) and other initiatives that will generate revenue in the short term (LabMobile and 3D courses). We have a full time person working on all this to ensure coordination and continuity (Ethienne).
- Some of these initiatives also address the capacity problem, bringing more people to SENSORICA
- We are making SENSORICA's values more visible, in order to nurture the open culture.

## *Lessons to be learned on the Open Value Network model*

*Can the Open Value Network model (economically sustainable P2P network creating products to sell on the market) **work**? That is, can it be sustainable?*

**Tibi**

I don't have any doubt about it, the world seems to converge towards what we've built. We might be a bit too ahead of our time, which makes us a bit more vulnerable. But the system is complex and we need to adapt at every scale. Other problems will occur in the future as we grow in size and complexity. The crisis is part of the process.

*How do you think the OVN model helped or hurt Sensorica in the previous stage?*

**Tibi**

I think the OVN model saved SENSORICA.

One important lesson that I take from this crisis is that the fluid structure of the network saved it from becoming something else. It is easier to transform a formal organization (what I call a box) than a fluid one. The OVN model makes SENSORICA more resilient. Moreover, it also helps with its recovery, because action is possible since affiliates are

autonomous, and positive action (leading to improvements) becomes a the vector of change (people naturally follow it). It just takes a few determinate individuals with a lot of initiative and creativity to generate positive action. Hierarchical environments stifle this kind of change, 1. because the sense of belonging and ownership is weaker, and 2. because those on top use their power to crush initiatives that go against their beliefs.

*Do you think there were problems in the execution of the OVN model? If so, how would you improve the execution?*

**Tibi**

We can't go faster than we can... I think we've done amazing work! Culture takes time to form, infrastructure takes time to build, wise rules can only come after problems occur, ...

*Can the OVN model still work for Sensorica (creating sensors to sell on the market)? If so, what will it take to get there?*

**Tibi**

Definitely YES. Refocus activity on revenue generation and increase in capacity. This requires a shift in focus from complex projects to very simple ones, which only utilize assets that we already have.

- the 3D course uses our knowledge and know how and a 3D printer we already have;
- the FabMobie uses our knowledge and know how, a car, and the same 3D printer.
- crowdfunding the NRP-VAS is very likely to succeed, if we agree on how to run it.
- crowdfunding the 3D printer is also a low hanging fruit.

The Mosquito and other complex projects can be left for later, or for new affiliates.

**Bob**

What will become of the Mosquito, Mantis and other sensor products? Are they effectively dead? Or can they be revived? This question is also related to the questions about product quality and sales obstacles in the observations section.

**Tibi**

Nothing can be declared dead in an open environment, because no one has the power to kill anything. Someone can come later and take a dormant project and bring it to new heights.

Moreover, there is activity in the Mosquito and Manipulators projects. I also logged time on the Mosquito last week. I am just proposing a priority shift. Those who want to reinforce the network can follow my advice.

How close were they to being usable (and sellable)? Do the skills still exist in the network to complete them? What would it take?

**Tibi**

The skills do exist to complete them, but the thing is NOT to rely on already available resources (see my intervention on the *open culture*). the proper attitude is: the skills are out there, we just need to attract them. I think these projects will reach maturity, and it is important for SENSORICA.

If no sensors, is it still Sensorica?

**Tibi**

There is nothing in the air that suggests a change in mission for SENSORICA. An open network forms around a center of interests. SENSORICA's is sensing and sensemaking.

Did the newly privatized Tactus ever get going? Will it try to finish and sell the sensor products?

**Tibi**

Tactus has always been a private corporation. It was created as an Exchange firm. Tactus is still operational today, since it is still used to get some grants (I'll put new info on the [revenue page](#)). Tactus can commercialize the Mosquito and the Mantis and other things. Other Exchange firms can do the same. I am part of Tactus with Ivan and Francois. We don't need to be good friends to do business together. But if others think otherwise, we'll just create another legal entity as Exchange firm and here we go again. That is the advantage of the OVN structure. The capacity is in the network, everything else is just interface that can be easily replaced.

*What other lessons would you learn from the Sensorica experience?*

**Bayle Shanks**

Some recommendations:

(1) A clear decision-making procedure.

(2) This one is a recommendation for future forkers, not for SENSORICA: Someone who wants to fork should consider informing every member of the leadership privately before taking any action beyond discussing the idea privately with others, and before informing the public (even if the forker is themselves a member of the leadership). While this is only a recommendation, not an obligation, note that onlookers are more likely to consider a fork to be 'hostile' if this is not done.

(3) Many people cannot participate in long email threads. Permit and encourage off-list conversation, particularly on the topics of strategy, process, and interpersonal matters. Minimize traffic on the main list.

(4) Maintain a short document that lists each person who is working on the project half-time or more, and what their primary roles are. Each person is accountable for each role on their role list. It is understood that most people may from time to time pitch in to help with tasks outside of their primary roles. If there are some activities that you often do but that, if you ran out of time, you would stop doing to make time for other things, then those activities are not a primary role for you.

(5) Design the organization to be more amenable to the Producer mindset ( <http://organizationalphysics.com/2011/11/11/the-producer-style/> ). The Producer works very hard and likes concrete results and dislikes process, paperwork, and excessive talk. They are happy when their concrete achievements are recognized by others, and unhappy when they don't see concrete results coming from others. This mode is at odds with an organizational design which relies upon frequent participation in wide-ranging discussions or in paperwork such as filling out timesheets.

## Discussion

Tibi:

\* The reasons that you give for people's rejection of 'open culture' are based on disagreements about corporate strategy, and on personal incentives. I would like to highlight another class of reasons: being transparent, using social media, reading email lists, documenting work, using a

value accounting system can feel like (and in some cases actually are) just useless 'talking' and 'paperwork', taking time away from actual productive work.

\* Imo it's infeasible to persuade everyone in a large group that a given set of work habits or a given strategy is good (consensus decision-making). Your solution seems to be to recruit people who naturally favor the chosen culture and strategy. But imo future issues will inevitably come up that you haven't thought of, and the new recruits, who all agreed on the old issues, will disagree about the new ones. Your solution to this seems to say that's not so bad, since there is no formal organization people will work it out via social mechanisms and maybe split into sub-groups. However, there are some organizational habits and tools which require everyone or almost everyone to adopt certain habits in order to be useful.

Therefore, I feel that it would be better to have a formal organization with a formal decision-making system. Yes, this incurs the costs of the existence of power, coercion, and exclusion, the creation of winners and losers, and the danger that the organization could be taken over by clever legal gaming. But it provides a way to (a) limit the time spent on meta-discussion, (b) provide a way (beyond social pressure) to incentivize or even mandate from above the adoption of tools and practices which only have value if almost everyone adopts them, and (c) allow the organization to make 'hard choices' in strategy, e.g. saying 'no' to some path without strong proof that that is the right decision, just for the sake of not pursuing too many paths at once.

To make this more concrete, 'open culture' provides examples of habits that you would like everyone to adopt. A value accounting system is a tool that you would like everyone to adopt. But without any top-down decision-making, only that subset of individuals who personally believe in these habits and tools adopt them. An example of a hard choice in strategy is whether or not the Mosquito should be prioritized.

(you might object, well, even in traditional organizations with a lot of power, top-down fiat fails to cause actual use of tools if there is not real bottom-up 'buy-in'. Therefore you might conclude that top-down power is useless and buy-in is both sufficient and necessary. Imo this is too extreme; some degree of top-down power and some degree of bottom-up 'buy-in' are both important factors)

I personally advocate some degree of hierarchy as well as a decision-making system (not as much hierarchy as in traditional companies but more than SENSORICA), but note that you can have formal decision-making even without hierarchy if you choose.

(note that i am only giving my thoughts here and i feel that the sort of organization that SENSORICA is to be is itself one of these 'hard choices' in strategy, and is something that you should decide regardless of how i feel about it)

-- Bayle Shanks

Since nobody else is commenting on Bayle's comment, I (Bob) will:

I agree with most of what Bayle wrote, but might explain some of it differently.

I think about it more radially (as a series or onion of concentric circles) than hierarchy, but in some instances, it amounts to hierarchy.

I also think this is what happens with almost any informal organization: a core group evolves.

To make this more open and fluid, I think the core group needs to do continual outreach and inreach. By inreach, I mean developing people through the concentric circles until they become part of the core, and removing people (or encouraging them to leave) from the core.

This is what David Ugarte called "hard to join, easy to leave". Or, Lynn's daughter is joining Doctors without Borders. Although she has a world of experience, they put her through a training class, and made her wait months for an assignment, which at first will be to work in the US with supervision, before she is sent out to "the field".

I actually think Sensorica did this pretty well. They welcomed newcomers, trained them, and brought some of them into the core. One of the things I liked about them. And Tibi in particular was a great outreach.

However, in some cases (e.g. Yasir) people were brought directly into the core without being tested.

Another aspect is Tibi's continual denial of being the leader of Sensorica. He clearly was, at least as far as it was an OVN. But with leadership comes responsibility. Here is the seminal essay about the consequences and meaning of such denial: [THE TYRANNY of STRUCTURELESSNESS](#)

Several people were leaders in Sensorica, in different capacities. Tibi wanted such "voluntary subordination" to emerge from logging data. But it operates both informally and formally, and you do not need to wait for the logging data if you have a solid core.

None of what I wrote here means that the organization needs to be formalized, and certainly not legalized. On that last point I agree with Tibi. No legal model will fit. Just use them tactically as fronts.

Tibi and I will continue to disagree on a lot of this. He might be right. Time will tell. We need lots of experiments.

--Bob

Comments From Frederic D

I have finally decided to add my 2-cents. There has already been a lot of good discussion in this document, but I thought I would add what I see from my point of view.

A major difficulty comes from trying to develop some hardware in an open network. Hardware development requires a lot of hands-on work, putting things together and testing them. This is almost impossible to achieve in open network with different people in different physical locations. For example, I see a lot of effort "wasted" in re-developing laser drivers and / or DAQ hardware. I could easily do most of that and build what is needed, but since I am not in the same physical location, I cannot do that. This would require some kind of sharing tools (similar to the github for software) which apparently do not exist. And that would also require efficient communication within the whole network, which currently does not exist either. It does frustrate me to see wasted effort in duplicating existing hardware, but I cannot do anything about it. And since I am not 100% involved in sensorica, I just let it go and concentrate on my own business. And this is in part the reason why I am not longer as involved as I used to be.

Just my own observations and comments.

That's all for today 17 June 2014.

FD