Bridging Silos
A new workshop method for bridging silos

Andreas Wettre, Birger Sevaldson, Palak Dudani
The Oslo School of Architecture and Design, University of South-eastern Norway

Abstract

This paper addresses the problem of bridging silos. This is a universal problem found throughout the public and private sectors. It is a challenge when different organisations need to cooperate as well as when departments within the same organisation need to communicate. The paper presents a preliminary report on the results from a series of workshops on solo bridging held in the frame of the Human Systems Engineering Framework (H-SEIF) research project in 2018-2019. Although the workshops were based on gigamapping, we developed a special format to address the issue of silo bridging in a practical and useful manner.

Introduction

In society today, navigating increasing complexity is one of the major problems in any organisation. Every development project involves multiple partners with different expertise and from different organisations, often referred to as silos. While the collaboration has to be aligned, the bigger problems that need to be addressed are often poorly understood. Typically, this implies fragmented and specialised views of the problems and the lack of a holistic overview and systemic understanding. At the same time, often the problems that are addressed arise from living systems that change while we are in the process of planning.

This situation is universal and found in most public service organisation, amongst policy makers and in most, if not all, private companies. Communication breakdown is central to this problem. The sheer scale of the problems requires that collaborators have different types of expertise. Expertise is naturally departmentalised. The problems of communication begin within individual departments, between groups and individuals but they escalate when interdepartmental communication and collaboration are needed. This is widely recognised in discussions about silos (Bannister, 2001; Bundred, 2006; Dell, 2005; Diamond, Stein, & Allcorn, 2002; Serrat, 2017; Stone, 2004).

This paper reports on how this problem is discussed within the context of an innovative workshop design to specifically address communication ruptures. The design combines gigamapping (Sevaldson, 2011) with systemic teamwork coaching (Wettre, 2012).

Theoretical framework

Systems Oriented Design is about understanding, interacting with and designing complex systems. People that need to collaborate in order to suggest solutions for change in systems of systems need to understand and agree upon the complexity they are dealing with. To create a shared understanding, it is essential to communicate at the same level and to share views and perspectives that can be questioned and understood by others (Sevaldson, 2015, 2018). A group of people form a system or systems of systems. This poses challenges because of the level of complexity and the human aspect. Looking at organisational complexity, one can hardly trust a process purely based on a rational analytical approach, singling out particular problems that could be addressed with some actions to create an expected result (Stacey, 1996, 2007). We need to understand the construction of knowledge in a more organic way where shared understanding is something we gain when interacting with others and working together to try to understand the complexity (Hein, 1991; Huitt & Hummel, 2003; Jonassen & Rohrer-Murphy, 1999; Vygotsky, 1997). This is what actually happens when a group of people are involved in gigamapping, which has also been described as sense sharing (Sevaldson 2017). However, we aimed to enhance this effect.

Praxiological framework

Over the past several years, awareness of gigamapping as a dialogic framework has increased. This heightened awareness is also based on Andreas Wettre's (one of the authors of this paper) extensive experience applying gigamapping in management consulting with leader groups in private companies and in the public sector. He observed how groups could have open-ended, conversations, where the participants could jump between issues effortlessly while maintaining a large degree of consensus. These conversations were still coherent and highly communicative even though the participants held different positions and perspectives. In fact, because of their free and open form, such open visual dialogue sessions would elicit different views and perspectives, which the participants were unaware of at the outset. A normal assumption is that team members presume that their perspective is shared by others. Only by addressing the *unknown unknowns*[1] can rupture emerge and be addressed (Sevaldson, 2018). We find lack of knowledge between silos to be an important obstacle that must be addressed. It seems useful to regard the lack of knowledge between silos in the framework of the Johari Window (Figure 1).
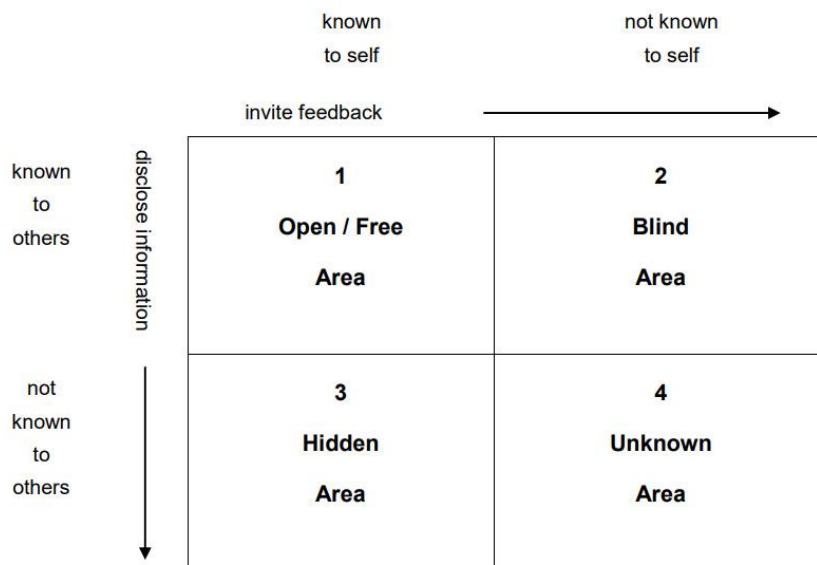

Figure 1: The Johari window shows four different knowledge-sharing situations between individuals and groups.

Although we have extensive experience using gigamaps in stakeholder groups and co-design sessions, they emerged as an effective tool to create alignment between different stakeholders and to increase awareness of the differences between them. Ruptures between actors in design processes was addressed by Sevaldson (2015, 2018) who stating that gigamapping creates value beyond gathering data and information and exploring the relationship between them to develop pictures of complex systems. Much of the value of gigamapping lies in the ability to bridge ruptures through sense sharing (Sevaldson, 2015, 2018). Based on this background information, we thought that it would make sense to combine

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[1] The term, unknown unknowns, refers to the things one does not know are an issue, so that one is unable to formulate relevant questions. The term was created by Joseph Luft and Harrington Ingham, who developed the Johari Window

gigamapping and systemic team building approaches in one workshop that was specifically geared towards silo bridging.

The project network

Human Systems Engineering Innovation Framework (H-SEIF) is a three-year R&D project, financed by the Norwegian Research Council and its partner companies. The project is led by Semcon, the University of South East Norway with the Department of Science and Industry Systems. The Oslo School of Architecture and Design, Institute of Design is the academic partner. This also includes a PhD candidate from USN and master's degree students from USN and AHO. The research is based on industrial case studies applied in an industrial setting and an industry-as-laboratory approach (Muller, 2011). The network of industrial partners includes Semcon (project management), Kongsberg Innovation, TechnipFMC and the Ulstein Group.

The challenges

The Silos

Organisational silos are a necessity. It is important to put people together that share goals and interests. An organisation usually has one of two types of silos: a discipline segment, consisting of designers, engineers, financial, marketing, etc., or a market/customer segment. In one way or the other, specialisation is required. This is the case, for example, in car sales where there are completely separate branches, such as privately-owned cars, company cars, transportation vehicles, construction vehicles, etc. We want to create smaller environments for people to develop a level of expertise in their discipline or market area and to ensure that the communication routes are shorter and faster. Therefore, silos are good and necessary.

However, silos can never exist in isolation. There will always be many complex issues that require collaboration between silos. We need to bring the people in these silos together and make sure they collaborate in a way that utilises the diversity they represent. Most organisations are completely dependent on the cross-communication between silos. However, this can also result in a severe bottleneck, where communication halts, where misunderstanding flourishes and where perspectives clash. Because that type of communication is very problematic, most people try to avoid it or cut it short. As one of the participants in H-SEIF stated:

> We, at the development department 'throw' our solutions over the cubical wall to the production department, when we are done. They do not have a clue about our thoughts and arguments for why the product has been designed in the way it is. They then make their own decisions and redesign the thing so that it fits production. This results in a suboptimal solution.

The first requirement for bridging silos and achieving a desired outcome is that people must *want* to work together.

The Communication

People form assumptions based on what they "observe" (see, hear, sense) and from the way they filter the information. This is described in the Ladder of Inference (Argyris, 1982). One major filter is a person's competence(s). If an individual's expertise is economics, he/she has a tendency to filter the information and form assumptions based on a cost/income perspective. However, a marketing expert will filter the information based on what he/she thinks he/she is able to sell. A user-oriented designer will see the information from the user's perspective. Another perspective on this is that people's filters influence what they see. A person's perception is very active in interpreting what he/she senses (Arnheim, 1969). People spend years developing their competence, and it is usually very difficult to understand another person´s expertise without spending a considerable amount of time. A person's goals are powerful filters; people's assumptions are formed based on how the topic will help them achieve their goal.

The Goals

Each silo usually has a set of goals, formal or unformal, or at least a sense of purpose. Sometimes, these goals will be coordinated between silos and strengthen each other. Other times, the goals are conflicting and may result in people working against each other. Thus, it is logical to ensure that all the goals are aligned and that they mutually strengthen each other. However, this is not always possible, or even desirable, and in any large organisation this can be very challenging and time-consuming. Therefore, in our workshop design we aimed to work without letting the goals of each silo reduce the participants' willingness to work together. We wanted to focus on the issue at hand, without letting the goals influence the process from the outset.

The Competence

When working with complex issues, it is necessary that people with different competencies work together. For this to occur, we need to let people use their expertise and ensure that it is available and understandable to every other person in the group. We need to create an atmosphere of curiosity and openness, allowing any questions to emerge in an environment that enables people to contribute without being interrupted.

The Emotions

In any situation that requires an individual to deal with complexity, frustration is natural. There are no simple solutions; it is important to spend time understanding and exploring before shifting into a solution mode. This, together with different goals and different competencies, may trigger a wide range of emotions. At best, this elicits enthusiasm for learning together. However, more often it triggers anxiety, resistance, frustration and, finally, a lack of engagement. Emotions are important drivers in the social systems we work with. Thus, to address the participants' emotions, we need to create a workshop that has room for emotions while simultaneously generating engagement. We want participants to be active and contribute. With some amount of playfulness, hopefully, they will also laugh a bit during the workshop.

The Power Dynamics

When putting people from different silos together, often including senior personnel, there is a risk of triggering some power dynamics in which some people dominate while others hold back and stop engaging in the process of understanding the complexity at hand. Some senior personnel may try to control and dominate the conversation, typically expressed by using long monologues to explain a situation. More introverted participants may find that there is no need to contribute, so they remain silent. To create an atmosphere in the social system that allows for bridging between silos, it is important to address the power dynamics.

We have developed a workshop in which we are able to modify the power dynamics and minimise the power games. We still need to allow the power structures to play out to a certain degree to ensure that the next steps will occur. We cannot overthrow the power structures in a one-day workshop; however, we need to find ways to soften them and communicate across them.

Description of the workshops

In the beginning of the H-SEIF project, the needs and perspectives were discussed amongst the partners and the need for improving collaboration internally and across silos emerged as a common challenge. We have extensive experience using gigamaps as communication tools, and we assumed that this visual form of communication would be useful in working across silos. For example, Andreas Wettre has observed how gigamapping allows participants to effortlessly jump between issues. Such jumps in the dialogue appear when one of the participants has a different perspective and draws the other participants' attention to the issue by pointing at a different area of the map or by adding a new area to it. To let this happen is important when handling complexity. This feature of the gigamapping dialogue seemed

relevant when bringing together people with different perspectives, e.g. bridging silos. This led to the initiative from AHO to offer a series of gigamapping workshops to the partners.

The workshop team included Professor Birger Sevaldson, PhD and Mr. Andreas Wettre as the main facilitators and Ms. Palak Dudani as the research assistant, representing the Oslo School of Architecture and Design. Since October 2018, the team has conducted two workshops at Semcon[2], one at TechnipFMC[3] and one at Ulstein Design and Solutions[4]. During this period, master's degree students and a PhD student from USN also participated in the workshops.

The goal of the one-day workshops was to teach the participants a technique that helped them bridge silos.

Workshop design

People working in silos tend to focus on their own goals, achieving their own results—sometimes at the cost of a common goal, or at least not playing well with each other. To bridge silos, people need to understand the bigger picture and see the perspectives of others. If they fail to do this, their assumptions will be built on their own perspectives, their filters and the starting point they have, blinding them to many potential ideas, problems and innovations. We want people to build on their different competencies and combine this in new ways. To achieve this, we need people to be:

- Open minded
- Use their specialist knowledge
- Not be defensive
- Understand more perspectives
- Test their assumptions but also be open to adjusting those assumptions
- See their role in the bigger picture
- Ask obvious and hypothetical questions that might lead to new ideas
- Not get stuck in their own ideas

To accomplish this, it is essential to help people feel comfortable in a workshop where no clear answers are given at the outset, and where we look into the problematic nature of the situation in different ways than most people are used to. Many of the people in our workshops have been trained to view problems in a certain way, and they have picked them to pieces and solved them bit by bit. We want them to be comfortable with the ambiguity and opaqueness of complex problems. We want to loosely facilitate the process to see what emerges; however, we must also ensure that everyone understands that we have a plan and a structure (to avoid "control freaks" from feeling the urge to take control).
To achieve, this we also used a strong team component to introduce meta reflections on the participants' roles and how they functioned in the social system at hand.

With this background, we designed a workshop where we:

- Let everybody be active for a large part of the day, also involving the more introverted participants;
- Try to avoid arguments that put people in defensive mode, resulting in blocking the workshop;
- Reflect together and listen to each other to facilitate faster learning.

We created a one-day workshop. The time axis is shown in the time axis shown in the table below:

Theory 1	Practicing	Theory 2	Reflect	Commit

Table 1: *Time Axis of the workshop*

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[2] https://semcon.com/

[3] https://www.technipfmc.com/

[4] https://ulstein.com/

Theory 1

An introductory lecture was presented to prepare the participants for the mind-set that was used. Thus, we introduced Systems Oriented Design and Gigamapping as a method. This was done in an "academic" style with a PowerPoint presentation conducted by Professor Birger Sevaldson.

Firstly, this created a common understanding for what we were going to do and helped the participants understand the bigger purpose behind the process. In this context, gigamapping basically means using markers on large format paper to draw complex maps of the system. The participants might have considered this to be another mind mapping or brainstorming exercise if we had skipped this introduction. It is important to understand gigamapping as a systemic tool that is used to dig into and understand the complexity at hand.

Secondly, we presented a lecture to ensure that all the participants got into a "learning mode". Later in the workshop we want them to be open to each other´s competence, be curious and, hopefully, forget about their silo´s goals. By starting with an academic lecture, then creating an opening for questions and discussions, we managed to create a supportive atmosphere. The participants learned more about gigamapping, even if some of them had used it before. This gave them a shared reference point.

By doing this, we also changed the power dynamics. This enabled us to set the scene for a learning experience where the senior personell and the other participants were on the same learning level.

Practicing

To make the gigamapping experience as relevant as possible, we work with real-life problems that the participants may have experienced in their own jobs. We invite all the participants to discuss things in pairs, so they can suggest potential topics to map. We add these topics to the flip chart and open them up for voting by asking all the participants to use a sharpie pen and mark their top three choices, using a dot. This highlights where the energy lies. This also ensures that we are including suggestions from the more introverted participants, again to handle the power dynamic challenges mentioned above.

We used the two topics that got the most votes for the gigamapping workshop letting people choose which group they wanted to join. We helped them get stared, but we interfered as little as possible, only doing so to ensure that they were curious about and open to exploring ideas and that the level of complexity they produced on the map was adequate (Figure 1).

Figure 2: Birger (left) and Andreas (right) observing participants as they work on their first gigamap.

The nature of gigamapping makes people participate and work together, sometimes in smaller subgroups and sometimes digging into details. In the vast majority of cases, if facilitated well, the gigamapping format creates an open and communicative atmosphere. We see little attack/defence behaviour; moreover, although the engagement may vary between people, we observe a high degree of participation. The gigamapping format distributes control to everyone in the group since it is based on eliciting diversity, not consensus. The senior personnel's ability to control what is being written on the map is very limited; this helps the participants identify and understand the complexity with less of a power game.

To maintain the learning behaviour, the groups map the same issue again—in a different format—moving from a relational map to a timeline map (Figure 2). After the explorative mapping, the people that are very solution-oriented might be a bit frustrated, saying things like: "This is not leading anywhere". We then ask them to do a ZIP analysis of their map. A ZIP analysis is a simple tool to find Zoom points or areas, problems and potentials and elicit ideas, innovations and interventions (Sevaldson, 2012).

Figure 3: A relational gigamap (left) and a timeline gigamap (right).

The Zip analysis allows the participants to create an action list (Figure 3). As the final step, we introduce them to the Impact and Threshold (IMP) analysis, which helps them prioritize. The IMP analysis is similar to the Pugh analysis, although the variables are generic and based on systems evaluation. These

variables include the systemic impact, the ripple effect and different central thresholds, such as economic, cultural and organisational thresholds (Sevaldson, 2016).

We end this practicing session by letting one group explain its map to the other group, and vice versa.
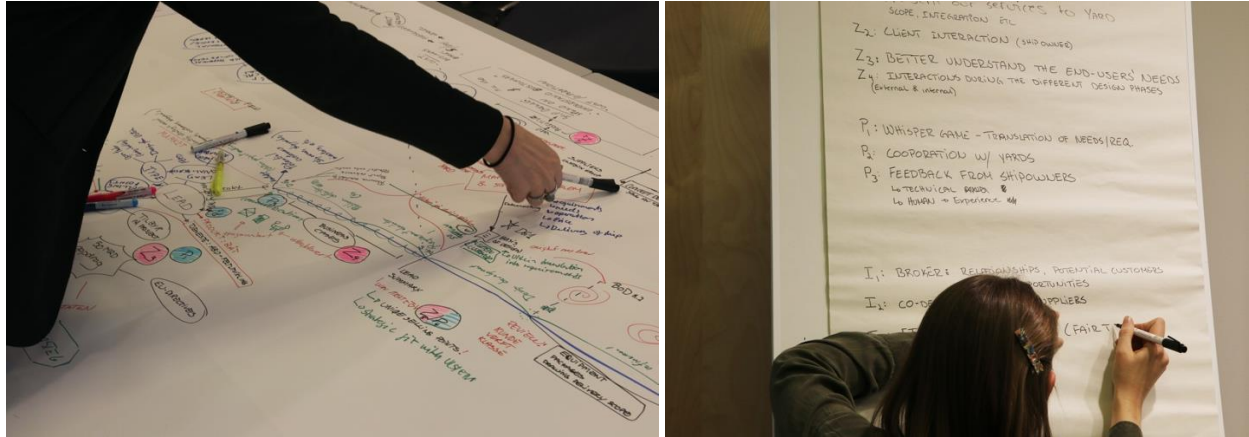

Figure 4: (Left) Gigamap with ZIP analysis. (Right) Another participant makes a list of Z, I and P items, as marked on the gigamap.

Theory 2

To create a stronger understanding of how the gigamapping will help bridge silos, we wanted to raise the conversations and reflections amongst the participants to the meta-level. After being in an active mapping/analysing mode, we wanted to move everyone to the reflection domain (Lang, Little, & Cronen, 1990; Lupton & Phillips, 2011). In that domain, people critically reflect together to form insights and realise how a tool, such as a gigamap, can be used to bridge silos as well as solve problems. We facilitated the leap to the reflection domain through a lecture where we introduced concepts from communication theory to increase awareness of what constitutes good communication. This has four key elements:

> 1. Ladder of Inference (Argyris, 1982; Senge, 2006). This re-emphasises the participants' experience after gigamapping, which is that people's assumptions are a function of where they are coming from, heavily influenced by what "silo" they belong to (Figure 5).
> 2. The decision diamond, a simple illustration emphasising the importance of contextualising responses so all the participants understand what kind of response will be fruitful.
> 3. Diversity, how it is linked to the separation of task conflicts and relational conflicts and how it can be both fruitful and destructive if it is not understood well.
> 4. Dialogical communication highlighting the power of dialog in relation to results (using a scatterplot by Bang and Midelfart [2009]).

While we used this lecture to get the participants into the reflection domain, we did not want to tell them how gigamapping helps bridge silos. Rather, we wanted them to reflect on this and draw their own conclusions.
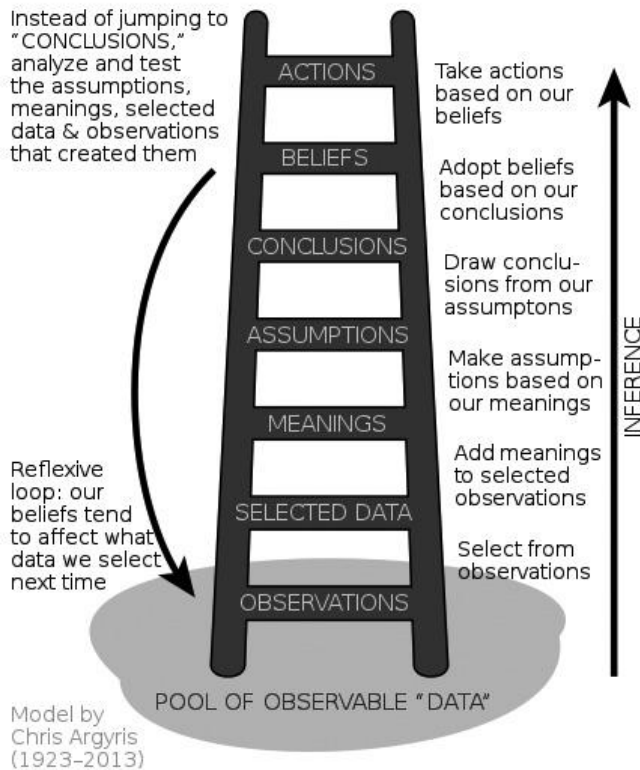
LADDER OF INFERENCE

Instead of jumping to "CONCLUSIONS," analyze and test the assumptions, meanings, selected data & observations that created them

Reflexive loop: our beliefs tend to affect what data we select next time

ACTIONS — Take actions based on our beliefs

BELIEFS — Adopt beliefs based on our conclusions

CONCLUSIONS — Draw conclusions from our assumptons

ASSUMPTIONS — Make assumptions based on our meanings

MEANINGS — Add meanings to selected observations

SELECTED DATA — Select from observations

OBSERVATIONS

INFERENCE

POOL OF OBSERVABLE "DATA"

Model by Chris Argyris (1923–2013)

Figure 5: Ladder of Inference (Image: Wikimedia Commons).

Reflection

To facilitate reflection, we used dialogical communication. In this session, we do not steer the discussion; we do not tell the participants who should be allowed to speak next. We only emphasise that each person must find the right timing to speak and add value to the dialog.

   a. We ask everybody to hold back, think before they talk, and determine if what they are about to say will add value to the discussion.
   b.   We want people to build on what has been said, and show that they appreciate what has been said.
   c.   What needs to be said should absolutely be said; critique and doubt should be appreciated in this session.
   d. We ask everyone to be curious, especially regarding contradictions, and ask good questions such as: *"It sounds like you mean something very opposite to what I tend to think, can you please tell me more? Maybe you see something I have not seen."*

The only thing we might do to facilitate this dialogue is to ask questions to get people to elaborate on their ideas. We do this to stop people's tendency to slip out of the reflection domain and into the personal domain when engaged in a discussion. The personal domain is where things are discussed out of one's personal preferences, desires and emotions. In that mode, a person is not open to reflections; they are

just stating what they believe and they often try to "win" the argument. This is the most common mode in discussions, and it tends to be less productive than when people are in the reflection domain. We use soft facilitation to hold the group members in the reflection domain.

We might also address comments to people who are not contributing, such as: "Eva, you are not saying anything. This makes me curious. Would you like to share what you think?" We do this to ensure that we involve the people who are more introverted or people who feel insecure about the dialogue format.

Throughout this session, people listen to each other and develop their own reflections. As facilitators, we gain a unique insight into the reflections. From these dialogues, we have realised that gigamapping is a very effective tool for bridging silos. For example, we heard people saying things, such as "When we gigamapped this situation, we saw that a possible solution was in another part of the chain than we were previously focusing on"; and "When you inserted that figure, I understood that we could look at this problem from another perspective".

Personal commitment

At the end of the workshop, we want to ensure that the participants do not view this technique as a "stunt"; rather, it is a start for how to improve the bridging silos process and create social support for using gigamaps. We know that uncertainty is one reason why people do not begin to use new tools even when they have expressed clear intentions to do so. Strong social support is essential to overcome this uncertainty and actually carry out the intention of using gigamapping more often (Skolseg, 2014). We aim to create this social support in the workshop.

We ask each participant to make a drawing on a sheet of A3 paper to show their reflections and demonstrate how using gigamapping will help them work better in the future (Figure 4). This lets people draw and be creative, which strengthens their memory of the output of the workshop.

Everyone then shows their drawing and explains it to the other participants. We post the drawing on the wall, take a picture of it and include it in the documentation. As everyone shares their intentions of using gigamapping the social support is built. By telling each other what they will do, the participants' commitment to doing it becomes stronger.

Figure 6: Participants presenting their representative sketches, describing how they see gigamapping being beneficial to them in their work.

Closing

Because we have tried to reduce the power dynamics throughout the workshop, it is important to place the power back where it belongs at the end of the workshop. Therefore, we ask the most senior person/highest ranking boss to close the session. To ensure that this is done in a positive way, we talk

with him/her during the last break to prepare him/her to take on this role. We also ask this person to talk about how he/she wants the work to be continued in the coming weeks.

Gigamapping observations

Threshold of participation

It is natural that people have different thresholds for jumping into mapping; it can be a daunting activity at first. Creating psychological safety is important for teams to succeed with gigamapping.

That is why we move the workshop participants towards gigamapping using gradual steps, from passive observation to partial engagement, before asking them to pick up their pens and write and draw. We found that some people were comparatively laid back in their mapping activity. The initiative was taken by 1-2 key individuals who then also inspired others to pick up their pens and start writing and drawing.

Instead of sitting down, standing puts a person's body in an active mode. It is possible that sitting down limits involvement; conversely, standing while mapping inspires more intense participation. We also discussed the difference between using a table and a wall. A table allows for a larger group to collaborate, although the participants have to allow for texts being placed in all orientations. The process can become more diverse and even fragmented since a table allows more sub-discussions to arise. A wall would create a clear orientation of the map. It also limits the fragmentation. We observed that, at most, the participants engaged in two sub-discussions about the gigamaps that were hung on the wall.

When asked for topics to map, the participants mentioned one and then jumped right into discussing solutions. They seemed to find it challenging to refrain from solving problems and they needed to be encouraged to move away from doing so. The participants encountered some challenges during mapping, so Andreas and Birger intervened. For example, some of the senior personnel tended to pull people out of mapping and into discussions. While some of these discussions might be fruitful, as facilitators we try to re-engaged people into the mapping process. At the beginning, the main task should be to build diversity in order to elicit differences in the specific worldviews and perspectives between the participants, representing different silos.

Clustering

As previously mentioned, tables and walls might allow for slightly different levels of clustering into subgroups and sub-discussions (Figure 6). Groups of 3–4 people spontaneously self-organised into clusters. These clusters were noticeable grouped by gender, although there was intermixing and communication between different participant clusters and genders. The formation of these clusters may be the result of a large mapping group intuitively reorganising itself.
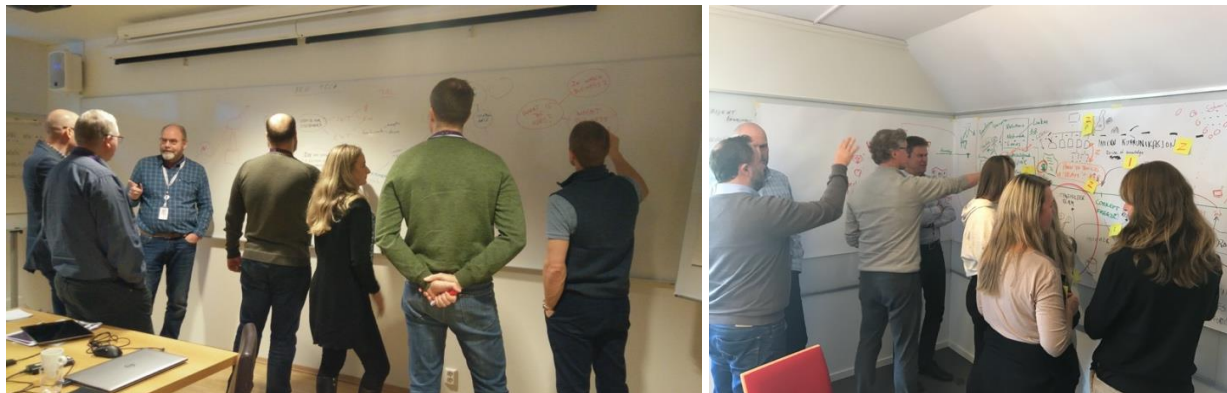

Figure 7: Two different workshops showing signs of clustering during gigamapping. The image on the left shows mild clustering; in the image on the right, two clear groupings based on gender can be seen.

One person mapping alone while the rest of the group is engaged in a discussion is an example of extreme clustering. Sometimes, this person is one of the people that is more introverted. As a facilitator, we let the process proceed for approximately 5 minutes, and then we ask the person to explain the drawing to some of the people standing close by.
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We have also seen groups split between into subgroups, on either side of the table. Later, these groups collaborated to piece together a coherent picture. There was fluidity between these groups, and later in the workshop, they formed different subgroups.

Clustering occurred naturally as the topics, personal interests and engagement emerged. Clustering allows people to easily find their place socially. Clustering is also efficient since several threads can be followed in parallel.

While clustering has advantages, in a large group the downside is that the conversations that occur within a cluster are missed by people in other clusters. This is partly compensated for when we ask the groups to present the maps to each other. In this process, the more holistic picture of the map emerges. This triggers a discussion between sub-clusters where the participants have to share their results with others.

These clusters may be formed by a large mapping group intuitively reorganising itself; some clusters join bigger clusters and some just dissolve by themselves. It is not possible to control, and it is a good introduction to complexity in organisations (Stacey, 2007)

Nevertheless, awareness of the phenomenon of clustering allows facilitators to gently intervene when needed. However, this has to be done by keeping social dynamics in mind and balancing this regarding the bridging aspect.

Even though the participants had not known about the ZIP analysis as a tool, they were able to implement it quickly into their gigamap. The utilisation of the ZIP analysis forced the participants to step back and inspect the entire map with a new perspective, and communicate with their colleagues again. Dialogue is the most important component of both the ZIP and IMP analyses; it helps to structure to process. Obviously, a ZIP analysis conducted in a one-day workshop after a few hours of mapping has limited value. However, the tools it provides can be applied in iterations and gain value and validity as the processes grow and develop, over time.

Floating: informal leadership

Within the subgroups, often someone took the lead role, asking questions, directing actions and making sure that the task was addressed by everyone. However, the lead role also shifted between group members as the workshop progressed, giving voice to everyone in the team. We are unsure if this was deliberate, but the teamwork appeared to be frictionless and comfortable in all cases throughout the project. No power dynamics ruined the process.

Coordinated Drawing vs One-by-One: In Group 1, we saw a more deliberate approach to gigamapping in which one person was drawing and others were observing. In Group 2, we observed a much more spontaneous approach to gigamapping where many discussions took place while the sketching or drawing was in progress (Figure 7).

Figure 8: (Left) One participant was mapping while others in the group were discussing. In another workshop (right), the participants seem to be mapping in a coordinated manner.

Cross-group learning

One of the members from Group 1 visited the Group 2 table to see the participant's work and talk to the group members about their approach. Not all the groups did this; therefore, we let the groups present their ideas to each other.

Individual learning

During the mapping session, some of the participants went further with their individual questions about mapping. This helped them shape their thoughts more coherently while adding to the gigamap.

Emotions

High energy levels, participant communication, enthusiastic visually mapping and laughter were positive signs of an engaging mapping session.

Research outputs

We managed to mix the systems thinking and praxis of leadership, therapy and design, letting people interact with one another and be curious about using a dialogical communication while gigamapping. We observed clustering and groups forming and dissolving. This clustering and grouping did not seem to follow the "silo-walls". It was more random; this probably strengthened the bridging process instead of reducing it.

This new workshop design carried out in the framework of an R&D project achieved the following goals; we:

a. Framed and formulated the need for better communication within and between organisations and across silos. Acknowledged that silos are not all bad, even though the term "silo thinking" is usually meant as a negative characteristic.
b. Defined the problem of silos as a cultural issue and a practice rather than as something that can be solved by strategic interventions. It is best solved by letting people work together in a way where goals and power dynamics are not a hindrance. We created a workshop where we let people show their own competence and be curious about other competencies.

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c. Combined two existing toolsets (gigamapping and team coaching based on systemic communication theory) in a new way that seemed to effectively address the problematic challenges of silos.

d. Created a workshop design that allows participants to become operational within a one-day training session.

We hypothesise that, because a gigamap forces team workers to externalise their discussions on paper, holding the pen and being in command of the writing/drawing could serve as an easier entry point for otherwise shy team members.

We have collected feedback that, thus far, has been very positive, and we have registered some evidence of the workshop's lasting impact.

Reflections from facilitators:

A workshop is a system in itself; in our workshop, we see many self-organising groups bringing up topics, leaving topics or developing them into the bigger system. We cannot control a workshop. We ask people to do different things; sometimes they do, and sometimes they do something slightly or entirely different. As facilitators, we must pay attention to the patterns that emerge and determine which of the approaches fail. We need to continue adjusting the input and the length of each session, and revise how the information will be presented.

While facilitating gigamapping is a hands-off mode of working with few rules, one must be very aware of the dynamics of the work as it emerges. However, there is one rule we should never violate: Good, intense engaged and explorative dialogues should not be disturbed when they are emerging. Moreover, it is essential to maintain the visual element of the dialogue. Nudging people who talk without drawing is important. Otherwise the dialogue will be lost.

The gigamapping workshops in the H-SEIF project were very positive experiences both for the participants and the facilitators. Some of the participants had previously used the gigamapping tool but most where fairly new to it. The majority of the participants were systems engineers or other engineers (one participant was a designer). None of the participants reacted negatively to the approach we used, which was less framed and looser than what they typically were used to in the engineering field. Thus, we did not experience any cultural thresholds. This might be because most of the participants were familiar with and interested in design thinking. It is interesting to see how open and engaged the engineering culture has become in these high-tech companies in Norway.

Excerpts from the participants' reflections

"Gigamapping is an opportunity to gather several perspectives from various stakeholders, discuss issues on how different stakeholders perceive it and build a common understanding".

"We found more actors/stakeholders during our mapping session than we previously thought, including suppliers, fleet owners and operations. It was interesting to try to not work using modelling or architecting rules, since gigamapping doesn't have those constraints".

"Different phases of the process have different requirements, including goals, timelines and people involved, such as stakeholders. A gigamap allows us to get an outside perspective on different aspects of the process".

"A 'live' gigamap, living within a gigamap work environment, is available at all times. This lowers the threshold for contributions, gives them the motivation to keep adding during the process and use it as a reflection wall".

"Gigamapping gives energy, but it is also frustrating because when you visualise, you become aware of the gaps and you feel the need to have so many more people to help complete it'.

"How do you map and understand stakeholders here, which will lead to a product or result in the operation? In this case, I think gigamapping has to be a perfect way of populating these issues and visualising what they are".

"For everyone to put their knowledge on the paper so I can get an overview, from my own perspective".

"Gigamapping helps us find unknown 'unknowns'".

"Lowers the threshold for contributions, gives motivation to keep adding during the process and use it as a reflection wall".

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