



Faculty of Design

2014

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Suggested citation:

Davidova, Marie (2014) Generating the design process with GIGA-map: The development of the loop pavilion. In: Proceedings of RSD3, Third Symposium of Relating Systems Thinking to Design, 15-17 Oct 2014, Oslo, Norway. Available at <http://openresearch.ocadu.ca/id/eprint/2097/>

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Generating the Design Process with GIGA-map:

The Development of the Loop Pavilion

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Abstract:

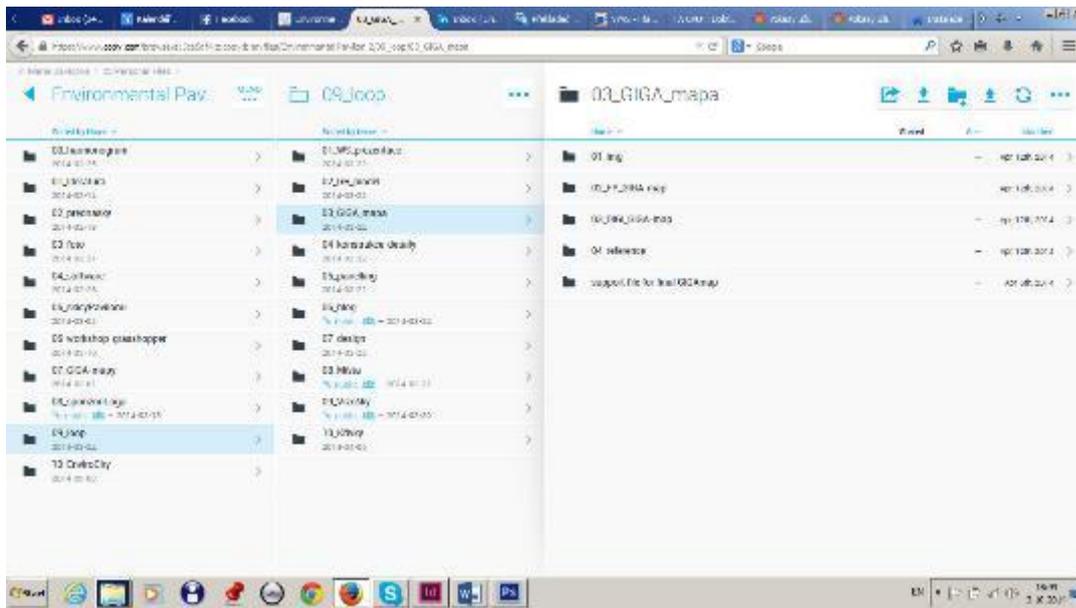
This interdisciplinary project involved the team work of the students from the Faculty of Art and Architecture at the TUL in Liberec and the Faculty of Forestry and Wood Sciences at the CZU in Prague under the leadership of myself, Šimon Prokop and Martin Kloda. Various disciplines, such as mathematicians, software developer, structural engineer, mechanical engineers, urban planners and arts managers were included within the design process. The goal of the one semester lasting studio course was to build a wooden, environment responsive, pavilion that hosted cultural events in June 2014 of EnviroCity festival. The pavilion absorbed the humidity at night, while evaporated it the arid sunny afternoons. Its panelling generated the circulation of humid air.

The research method was Systems Oriented Design, Physical Modelling, Parametric Design, File to Fabrication and 1:1 Prototyping, where GIGA-mapping became the all covering working tool of the design process. Besides the literature, the students used my own GIGA-map of performative wood research as a study material for the starting point. The overall knowledge was mapped on the paper board on the table. To use the table instead of wall is recommended by Birger Sevaldson for the reason of better interaction of the participants. (Sevaldson 2014)

After the discussion we decided to map and predict our design process. The timeline with proposed time schedule of the course and different roles and responsibilities of the participants were drafted. All the results and expectations were put on the board and discussed in the team. In that sense, the design process of the overall team was generated and controlled by the GIGA-map.

The First Step:

Before the course started, the students were invited to online folder on Copy, used for file sharing. Copy allows more data space than Drop Box, but we were struggling with real time. There students could find there related literature and time schedule of the course. The first day started with all day lectures on the topic area and information on the first task. We established a Facebook group for the online discussion as the students were located in different cities. Whenever somebody uploaded something to Copy folder, started also a discussion on FB. Copy folder had very organized structure.



Copy file sharing (Davidová 2014)



Discussions on Facebook group (Davidová 2014)

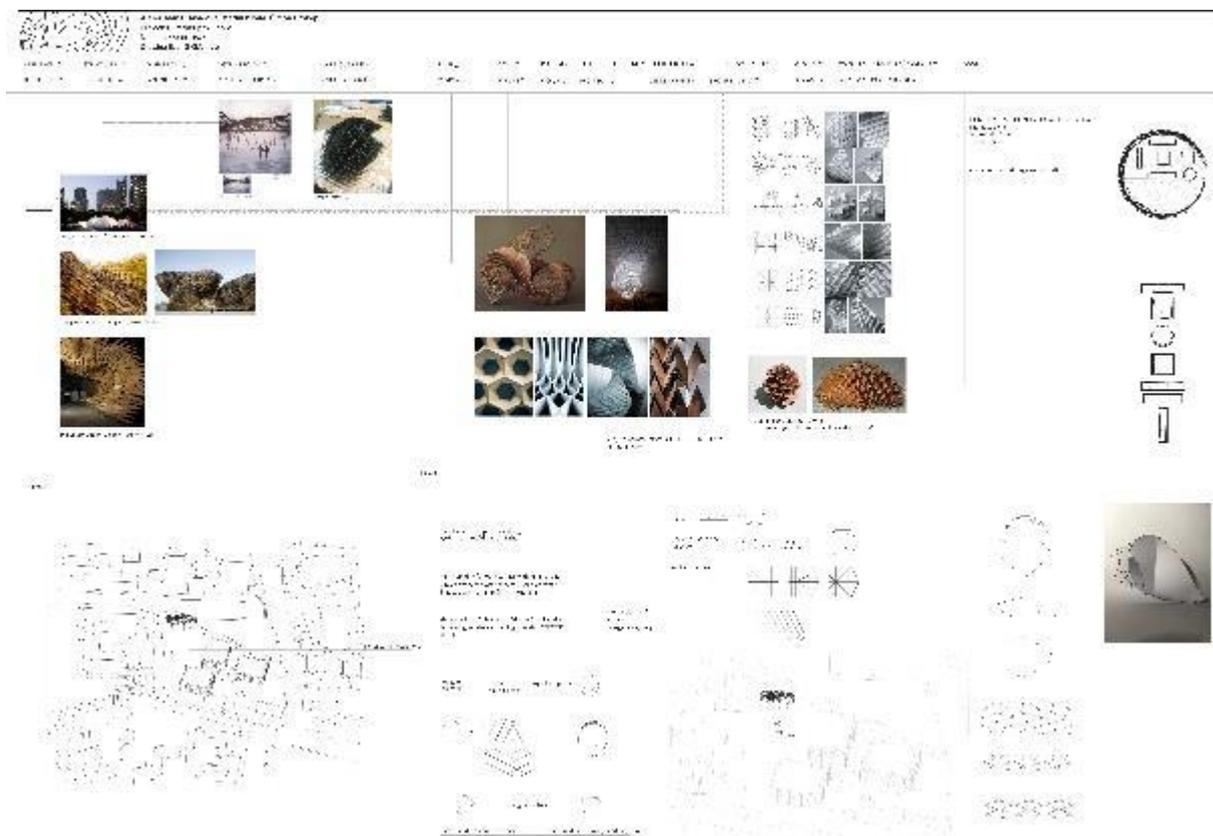
The students got two weeks for designing the concept of environment responsive pavilion from solid wood and creating a MINI-map of their research and design development. MINI-map, as opposed to GIGA-map doesn't cover about 300 items but else, it has the same mission.

“GIGA-mapping is super extensive mapping across multiple layers and scales, investigating relations between seemingly separated categories and so implementing boundary critique to the conception and framing of systems.....” (Sevaldson 2011)

In the sense of Performance Oriented Architecture, which was the goal of this project Michael Hensel is adding:

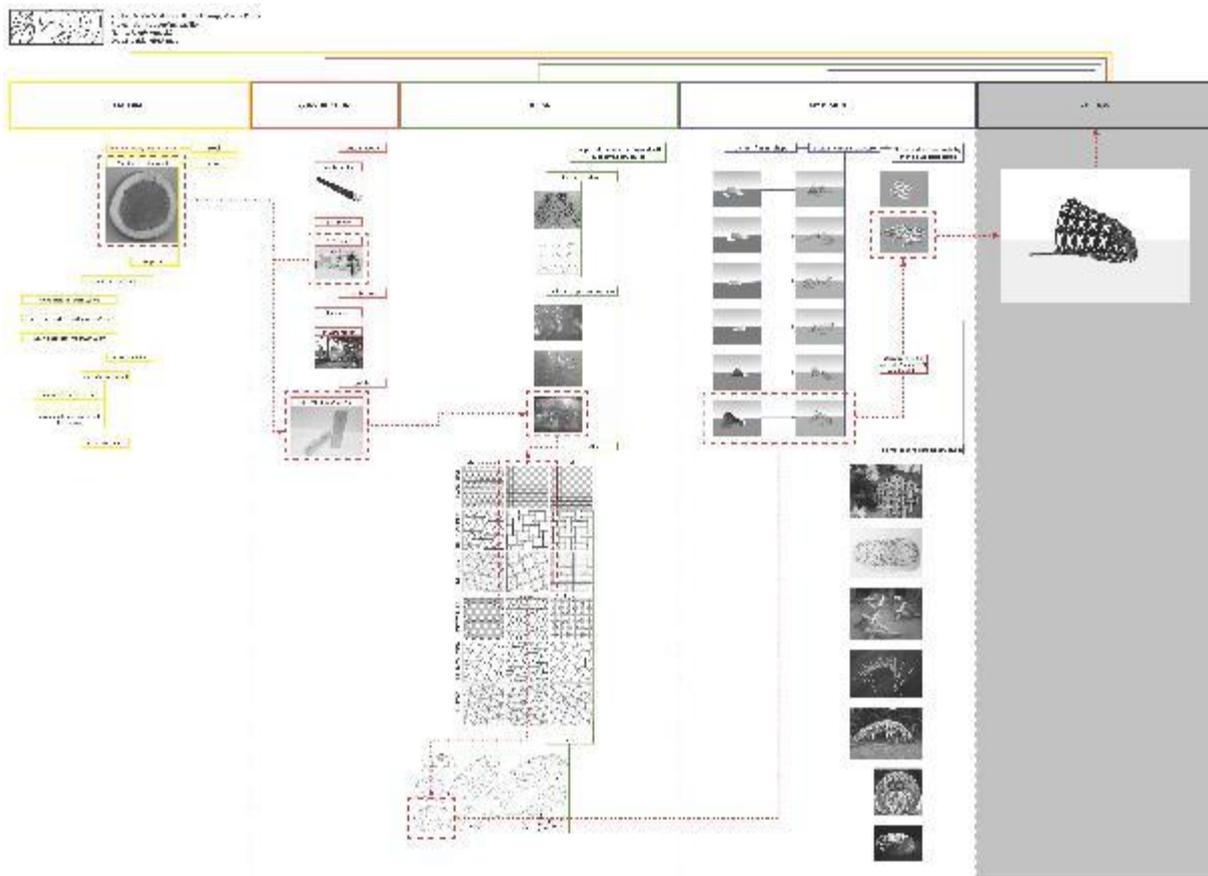
“GIGA-maps can be also used when exploring different strategies and approaches to integrating the different traits of performance-oriented architecture and help maintain an overview over directly or indirectly affected conditions.” (Hensel 2013)

It was interesting to note, that not all the students were successful with MINI-mapping and created them ex-post. However, they were able to involve themselves, working in the team on big GIGA-map. The students tested several software for generating the map but at the end, the Illustrator was selected as the main tool, allowing enough complexity in the relations. The same fact was also mentioned by Sevaldson. (Sevaldson 2013)



1st stage MINI-map (Hrůšová 2014)

Anna Hrůšová’s map was covering different inspirations stages with material and site analysis that lead directly to the design.



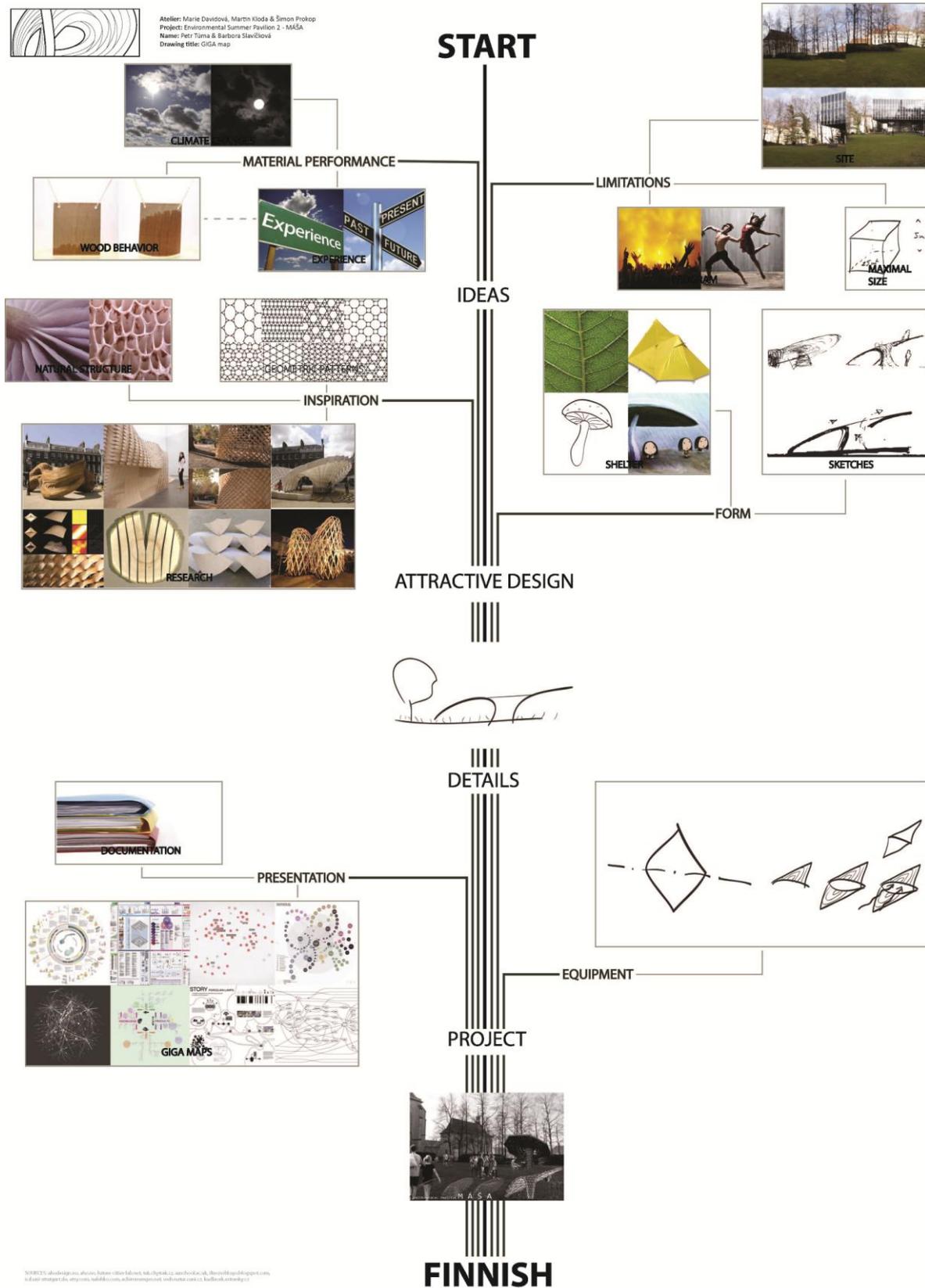
1st stage MINI-map (Kopecký 2014)

Jakub Kopecký started with the knowledge of the material then he explored the possibilities of tools we could use, followed by selfsupporting structures study that inspired his design.

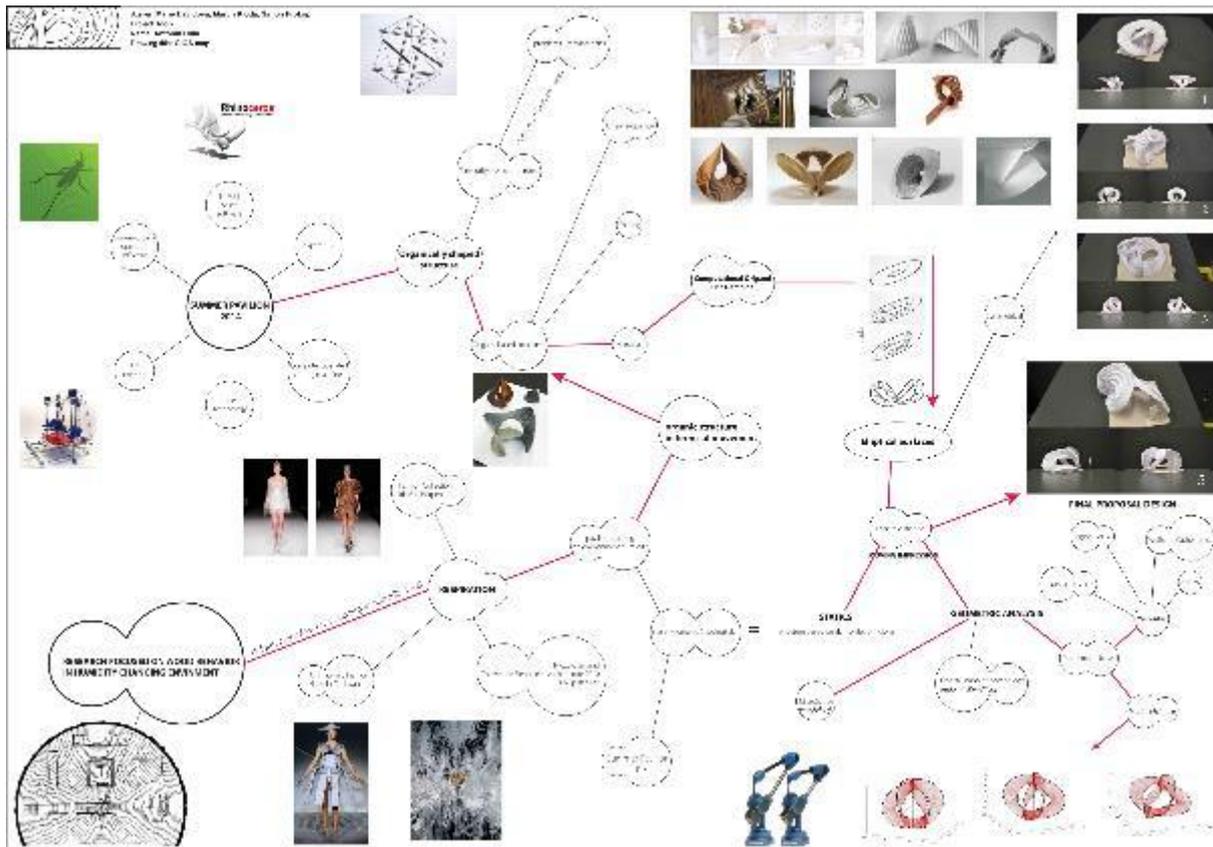
Barbora Slavíčková and Petr Tůma had a different approach from the others. Their process started with putting the stickers on the board. This method very well enabled them to collect data, on the other hand they struggled with connecting the relations. But in the end, when they were forced to make an order in their data and create the map in PC, they succeeded. Their map was showing all their design from the start to the finish of the task, covering the collected knowledge.

Sevaldson does not recommend the sticker method for the exactly same reason – struggling with relations (Sevaldson 2014) but the result by the translation into PC was successful. Barbora and Petr were the only students who worked in group. It might mean, that the stickers can well work as a starting point for fast communication in the team.

However, we decided to follow the recommendation and use thumbtacks further on for a big GIGA-map that was covering the teamwork on selected project that was to be built.



1st stage MINI-map (Slavíčková & Tůma 2014)



The winning design MINI-map (Hůla 2014)

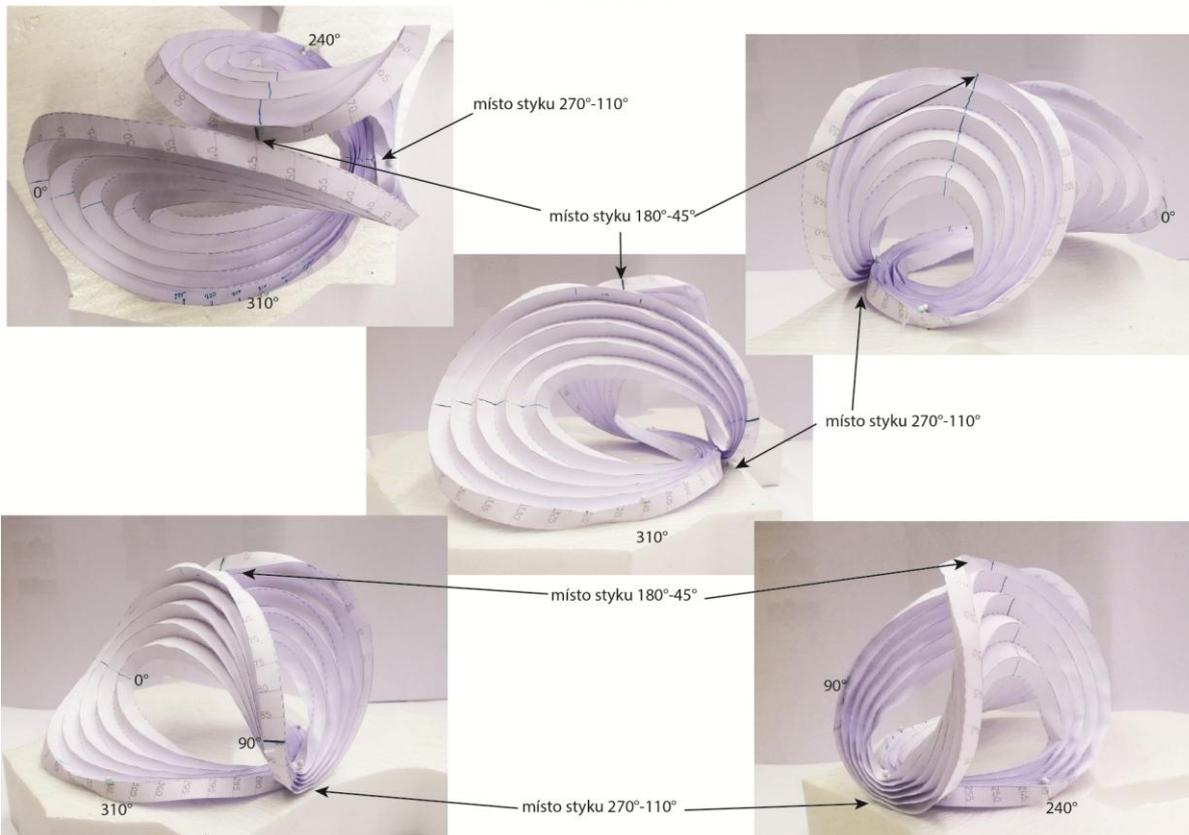
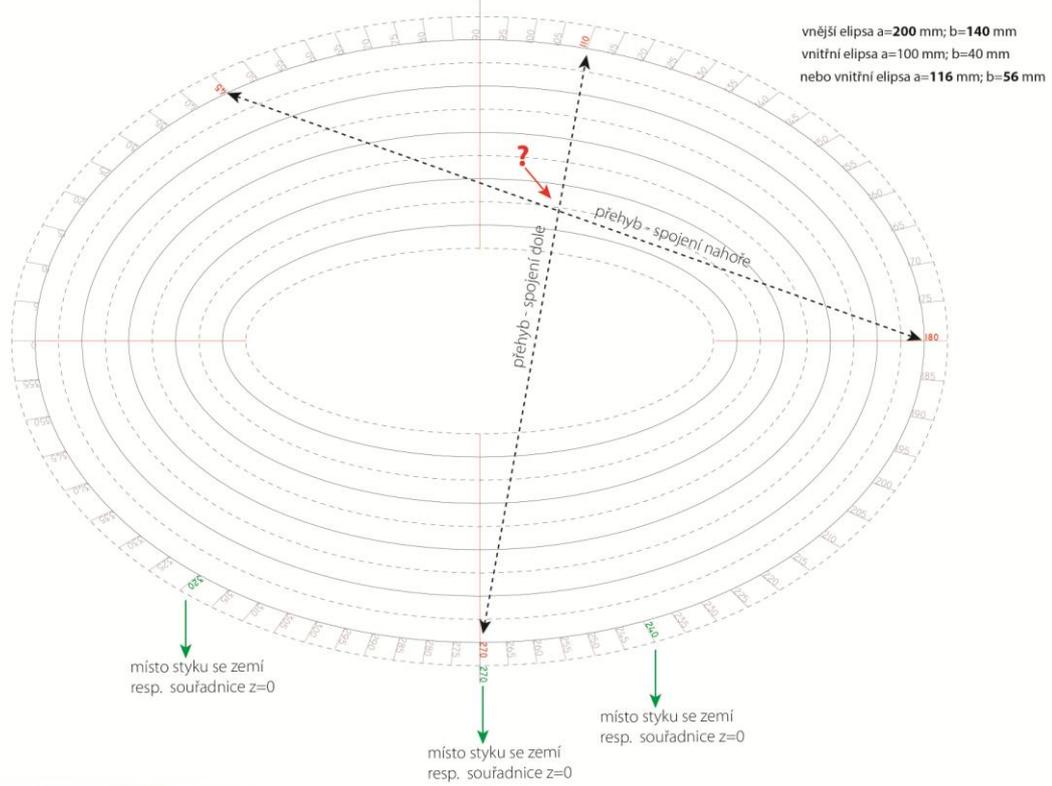
Work on the Winning Design:

Antonín Hůla's selected design was origami based, folded ellipse. It immediately asked for different professions who got involved in one big paper based GIGA-map. In the same time, the design of PC based GIGA-map was drafted and had an effect on the paper based one.

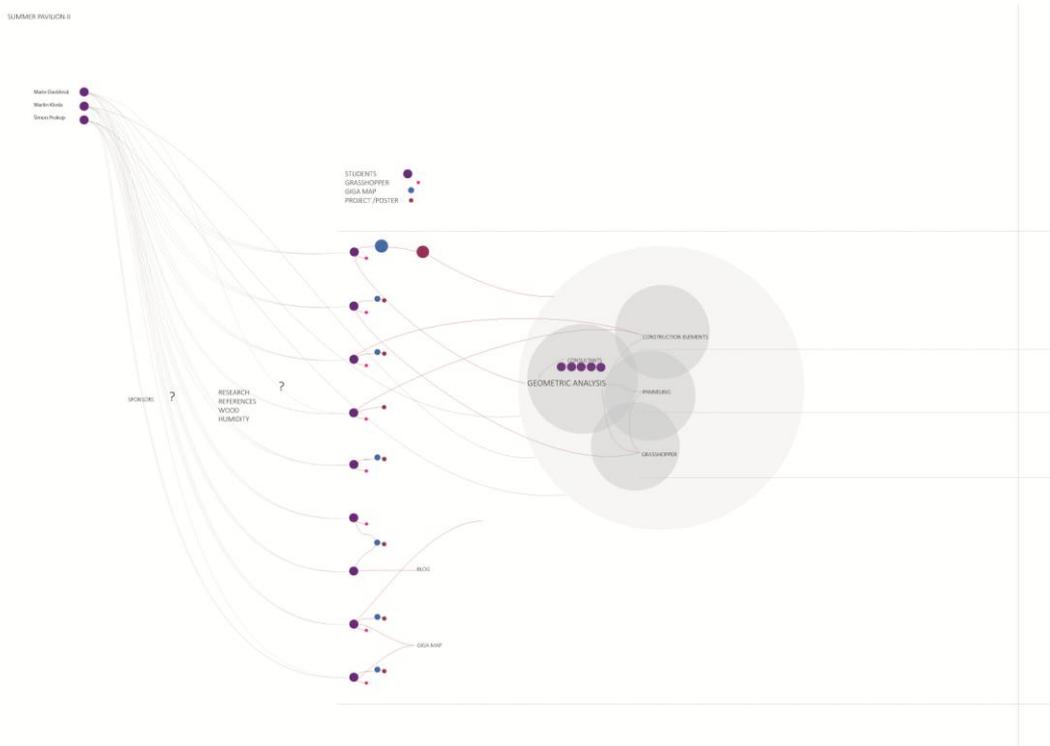
We decided to create time based board which was covering my own GIGA-map in wood research, all the founding from the MINI-maps from each student and started adding another professions involved. The board was set by the time line from the preliminary course schedule. This way, all the participants had an overview, in which design stage they were positioned and were aware about the deadlines. The time based mapping for the groups is explained by Sevaldson:

“Mapping in groups has an effect on dialogue. It fosters dialogues and collaboration. Especially the short workshop types developed for strategic meetings in leader groups has a very strong impact on the dialogue. These most often are time based maps that follow a timeline. The time line is used as a sorting device that is immediately understood by everybody. This sorting device allows the group to skip the agenda, as long as one has a theme to investigate. The conversation is allowed to jump back and forth. Jumping in the discussion is done easily because everybody is brought along in the jump by pointing to the time line. The conversation stays focused on the topic but remains open ended and holistic.” (Sevaldson 2013)

POPIS SKLÁDÁNÍ PAPIŘOVÉHO MODELU - ELIPSOVÁ VARIANTA



Loop Pavilion – the winning design (Hůla 2014)



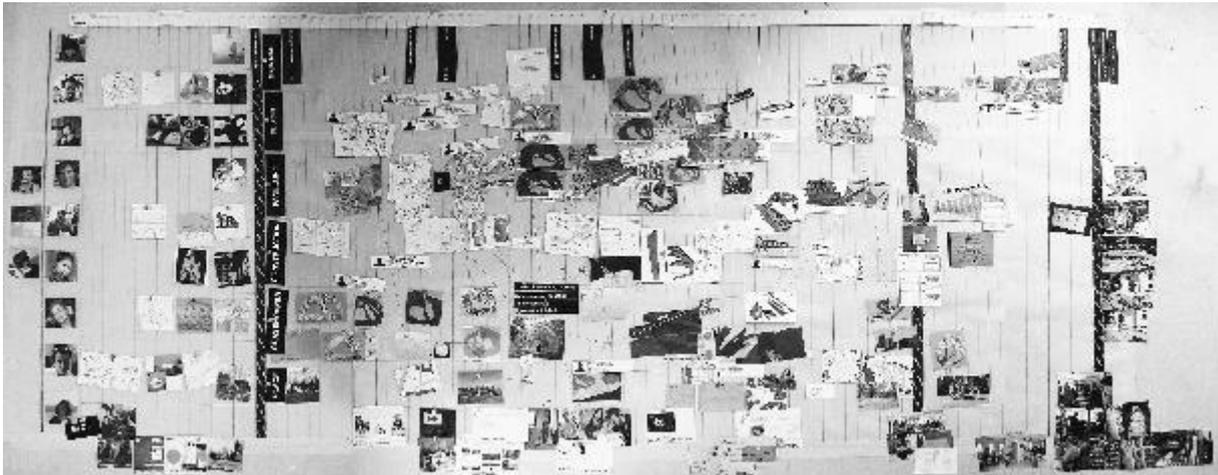
Draft concept of the final GIGA-map design (Hrůšová 2014)



WIP board based GIGA-map (Hrůšová & Pokorný 2014)

The students were divided into six different, interrelated groups with special responsibilities and communicated among each other, as well, as with different professions through GIGA-map, where

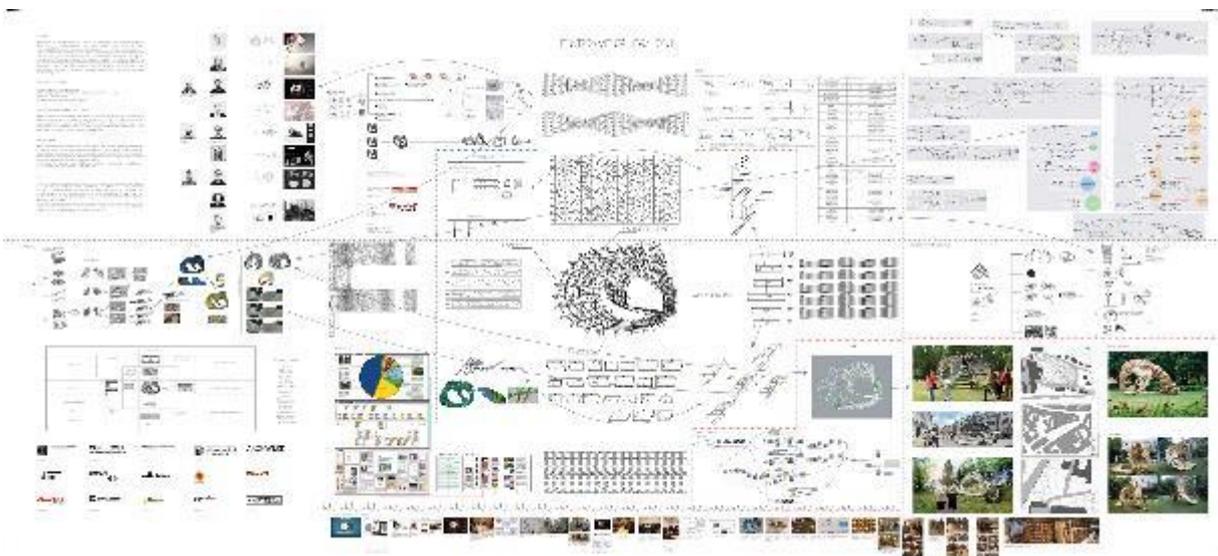
every group had its own line that was corresponding to the others. Further on, in the process of mapping, the groups were replaced by topics of research, where the roles were mixed.



WIP board based GIGA-map (Pokorný 2014)

We used pins and strings for the physical GIGA-map, so, it could be easily reorganized all the time during the discussion. All the files were printed and moved all over.

The final GIGA-map didn't respect the timeline but the research topics took the main place at the end.



Final GIGA-map (FUA TUL & FLD CZU 2014)



Loop Pavilion (photo Novotná 2014)

Conclusions:

The GIGA-map was raising new questions in the design process and therefore generating it.

Its time basis created an overview and control about the design stage and deadlines.

It was a great tool for the other professions to get overview of the project and to involve themselves more, than to be just asked questions.

It was a good tool to draft the design concept of the paper based GIGA-map in the PC first.

Creating a MINI-maps for each individual student/group was a good starting point that led the students into the study.

The use of my own research GIGA-map gave a good study material for the students, who, thanks to the time schedule, couldn't go so deep into the wood research themselves.

The time-line GIGA-map was a good tool for the process but might not be working for the final representation.

The sticker method might work, but only in the very first stage of the GIGA-mapping.

The method with pins and string was very helpful for the discussion and development.

The complex overview helped us to develop the concept of performative wood!

List of Participating Students:

Alena Novotná, Anna Hrušová, Antonín Hůla, Barbora Slavíčková, Jakub Kopecký, Jiří Fáber, Jiří Pokorný, Petr Tůma, Tereza Jílková, Radim Sýkora, Eliška Antonyová, Tereza Lišková, Filip Janata, Tomáš Kytka, Marie Kortanová, Vojtěch Holeček, Martin Vaníček, Jakub Hlaváček a Petr Havelka

This project would never happen without a kind support of the Faculty of Forestry and Wood Sciences and the Czech University of Life Sciences in Prague, the Faculty of Art and Architecture at the Technical University of Liberec, Stora Enso, Rothoblaas, Náradí Bartoš, Eurodach, Lesy ČR, Natura Decor, Easy Moving and Collaborative Collective.

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For further information, please, follow our blog at: <http://environmentalpavilion.tumblr.com/>