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ABOUT ...

ABOUT HEAL

HEAL is a movement towards a healthier building industry – for everyone who works within it, for the environment and for all of us who spend time in buildings. Our purpose is to co-create solutions on how buildings are designed, built and maintained, to enable healthy and sustainable living for all. We want to bring stakeholders closer to each other, bridge troubled waters and break silos in the building industry value chain by solving pains and problems with digital solutions and innovations.

Digital products and services can benefit the building industry throughout. Principle industry partnerships and engaging customers in a co-creation process can harness synergies and innovation. We collaborate around data and innovative tools, we are open and integrate solutions, taking the building industry towards a more efficient and sustainable future.

Stora Enso and Trä Group started HEAL as a joint development project after the companies met in 2017 at an accelerator program. Since then, HEAL is ready to partner with global organisations that share the ambition of making a difference in the future of building.

ABOUT THE RESEARCH

HEAL has a strong emphasis on applying a Service Design approach, especially when starting new projects. With a thorough research period the Service Design team aims to collect the insight that helps build a strong basis for working towards concepts that have the most impact for their users.

This study is based on qualitative research with data sourced mainly through 14 interviews. The interviews were conducted in June / July 2019 with professionals from various areas: civil servants from different sized municipalities, architects and designers specialised in educational buildings, and advisors with a broad expertise in their specific fields concerning materials, health or public building processes.

The report following this page is the result of the analysis of the data gathered through qualitative research. This data is presented anonymised to be able to achieve easier readability and due to data privacy reasons.

ABOUT THE ANGLE OF THE REPORT

The focus of this report is set on actionable steps that can be taken forward with foreseeable time and effort. Therefore, mainly the findings supporting these types of actions are described on the subsequent pages. Nevertheless are the authors aware of the broader angle in which the findings are settled: e.g. national and international laws, governmental decision making and incentives, or contract models in public building projects. While improving procedures and processes in this broader angle is out of the scope of this study, the impact that could be made on a governmental level is recognized by the authors.

During the research, good practices that are executed in municipalities and projects were found. These practices seem to have carried through the best educational projects up to date, but depend on specific knowledge and motivation of the stakeholders involved. For example, having experience on the public tendering processes and related laws, being able to push forward the most beneficial contract models and getting to work closely with the right professionals (cost estimation, interior designers, construction consultants etc.) help to achieve the desired outcome in building projects.



ROLE OF MATERIAL CHOICES IN CREATING HEALTHY EDUCATIONAL ENVIRONMENTS

HEALING THE BROKEN INDUSTRY

This report by HEAL is a joint study commissioned by Saint-Gobain and HEAL to look into how educational spaces are currently planned and built and what is the role of a material producer in making these spaces healthier and safer. HEAL acts as the facilitator to bring together different players in the building value chain to solve common pain points in the industry.

As a starting point the study took in notion the main opportunity and responsibility material producers have in improving the sustainability of buildings:

- The responsibility to produce long lasting materials
- The opportunity to improve the quality of building through materials

RESEARCH AIMS

The research conducted aims to understand how structure types, construction materials and interior materials get prioritised and chosen in the planning process for educational spaces in Finland. The goal is to understand how health and safety aspects are assessed in relation to choosing materials. Understanding the pain points of related stakeholders in regards to these choices helps to clarify how suitability, durability, sustainability and health of buildings could be emphasised and progressed through material choices.

“ The most important thing is that children can spend their days in healthy and safe environments.

Architect & father

Building healthy and safe educational spaces is urgent and considered as such by many stakeholders.

This report summarises the key findings from the research in the following topics:

- STAKEHOLDERS FACING THE CHALLENGE OF SEEING THE BIGG(ER) PICTURE
- ELEVATING LIFE-CYCLE THINKING
- STEERING DECISION MAKING TOWARDS BETTER MATERIAL CHOICES
- BENEFITS OF GATHERING PROOF & REFERENCES



Image: Architects Frondelius+Keppo+Salmenperä Ltd | <https://afks.fi/#afks-wins-competition-for-verkkosaari-and-hopealaakso-daycares/2>

14 EXPERT INTERVIEWS

The landscape of actors involved in educational building projects consists of professionals and of several different user groups. Experts from four different stakeholder groups were interviewed for this report in order to understand their needs and to inquire on their relations to the different users groups.



FUTURE PROSPECTS

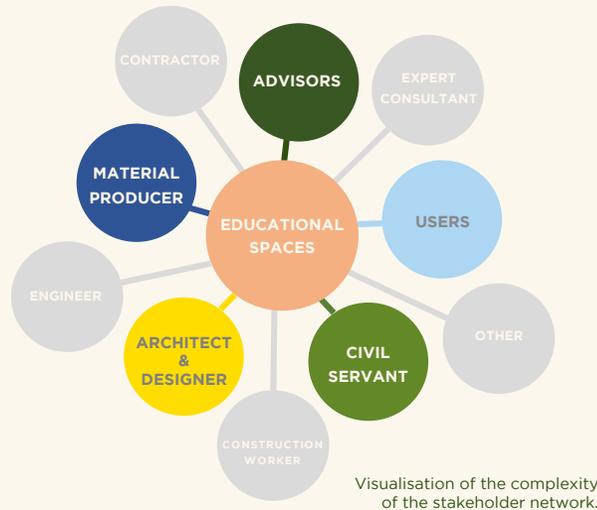
Currently, the building requirements on educational buildings are going through revolutionary changes. In Finland, especially renovation debt and poor indoor air are significant challenges to municipalities, and the pressure to adapt to new educational recommendations is straining. Sustainability regulations are becoming stricter as nations face global challenges due to climate change. Municipalities adapting to these pressing trends could benefit from support of professionals and experts. **Material producers have the opportunity to offer assistance to make it easier and faster to provide the best possible spaces for education.** Digital solutions can boost this development e.g. through speeding up construction time, improving efficiency in planning and building and maintaining health and safety through continuous monitoring.

STAKEHOLDERS FACING

THE CHALLENGE OF SEEING THE BIG(GER) PICTURE

COMPLEX NETWORK OF STAKEHOLDERS

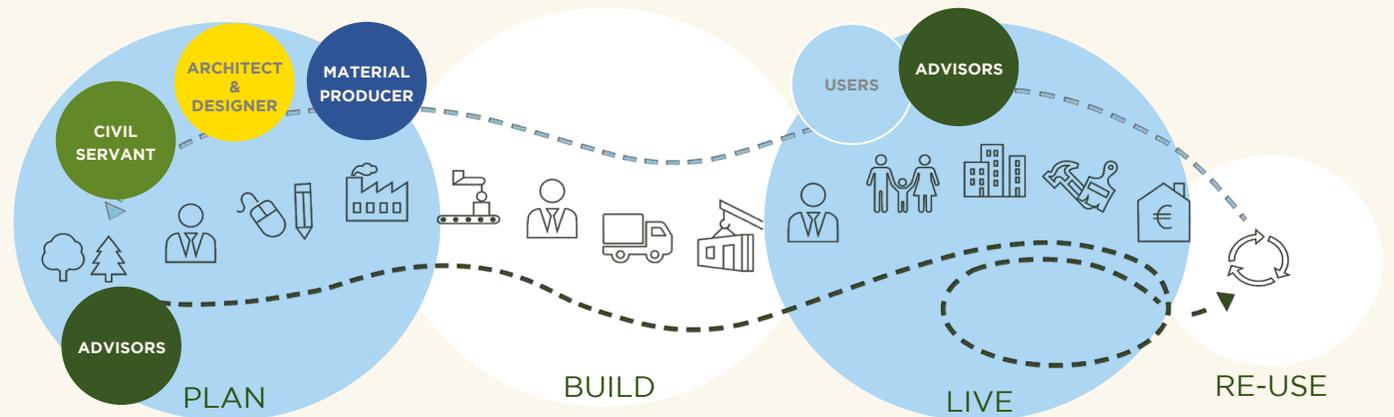
Wide stakeholder network around educational building projects poses a difficult challenge for cooperation and communication. It is often seen as a challenge to present the long term impact of material choices. Purchasing costs normally run decision making without any assessment of use phase costs. Stakeholders cannot reflect on the big picture in their daily work. In some cases this is due to siloed processes but more often the problem is rooted in the lack of reference or proof of use phase costs and impacts. Life-cycle thinking is seen as a point of progress, but is often not executed due to short sightedness.



Budget is the framework, but an architect can form an idea of the big picture and suggest which parts to invest in.

Municipal civil servant.

Architects are important entities in seeing the big(ger) picture. Depending on their ambition level, the right steps can be taken. This is an opportunity but requires extra work from the stakeholders.



Graph: Stakeholder groups interviewed for this study operate in different phases of the building value chain.

It is important that decisions, especially on budgets, are not done

too early **without proper information and studies**. Without different professionals presenting their views, there is a risk that the project plans proceed without any assessment of longer term or big picture impact. Therefore, early phase cooperation is seen as a key factor to share knowledge between stakeholders.

ARCHITECT AS A GENERALIST: CHALLENGES + OPPORTUNITIES

Whether material choices are reviewed in terms of their performance depends largely on the architects involved in the project and their level of ambition. Architects usually look at the big picture as their role demands for them to step in as generalists. Municipal workers involved in building projects in turn rely on experts (such as architects) and external consultants who give input for choices instead of gathering information themselves.

Improvements towards a more holistic approach to building have been taken in some municipalities. Some of these good practices could be repeated and shared nationwide:

- MUNICIPAL LIFE-CYCLE GUIDELINE (e.g. Helsinki)
- MUNICIPAL BUILDING CONCEPTS (e.g. Espoo)
- MUNICIPAL SUSTAINABILITY STRATEGY & ACTION PLAN (e.g. 59% of Finnish municipalities have included the aim to advance building from wood in their municipal strategy)
- PROOF THROUGH EXPERIMENTS (e.g. Vantaa)
- INVESTIGATIONS AND RESEARCH (e.g. Vantaa)

RECOGNISED POTENTIAL FOR

ELEVATING LIFE-CYCLE THINKING

Adapting life-cycle thinking has been slow and varies from town to town, but is seen as beneficial with development potential. Providing the right information to the right stakeholders through the right channels could help to tackle short sightedness as a symptom of the lack of life-cycle thinking.

Different stakeholders rely on each other – which often makes it challenging to move processes forward. **The scope of (implementing) life-cycle thinking is often too large for a stakeholder to take action,** thus it cannot be fully benefited from. Viable opportunities are needed and therefore the creation of actionable tasks should be supported. For example material choices could be made easier with offering information referring to life-cycle thinking.

“ People wouldn’t ask, can it be done cheaper but can it be done with better quality.

Municipal civil servant.

Knowing the overall costs throughout the whole life of a building would make a difference in prioritising quality materials for public building projects.

QUALITY VS COST

Prioritizing low costs instead of high quality was identified as one of the main problem areas that keeps life-cycle thinking from reaching its full potential. Municipalities are obliged to select the cheapest option – which is currently measured through the costs of purchasing and installation instead of the overall life-cycle costs. Communicating the benefits of better quality materials and comparing this investment to overall costs can help emphasise life-cycle thinking industry wide.

Therefore, the advantages of longer lasting, durable, easy-to-maintain materials need to be proven (e.g. through references) to support this thinking. (Quality) material choices can reinforce the users’ appreciation of a building. It affects how well a building is taken care of, thus extending the life-cycle of a building in the long run.

INFORMATION

An interesting opportunity to take on for suppliers is to offer holistic, understandable information on building materials. Cost information over the whole building life-cycle can lead to decisions based on quality instead of low costs. Currently, life-cycle expenses are not emphasised enough as it requires extra attention from the purchaser to plan and construct with the mindset of building long lasting structures. Especially the pricing of “new materials” is harder to communicate and argue for than the costs of frequently used material with known price information. Nevertheless, sharing references and best practices can be beneficial and can support to validate and justify the cost of material.

LIFESPAN & REUSE OF MATERIALS

The ultimate goal for all players in the value chain should be to take in consideration the entire lifespan of a building. Buildings should be built to last and designed to adapt to changing needs. The end of life of a structure should be taken in consideration already when starting a building project – could materials be designed for reuse?



Graph: The expenses during design and construction are much lower than the operational costs of buildings.

RECOGNISED POTENTIAL ON

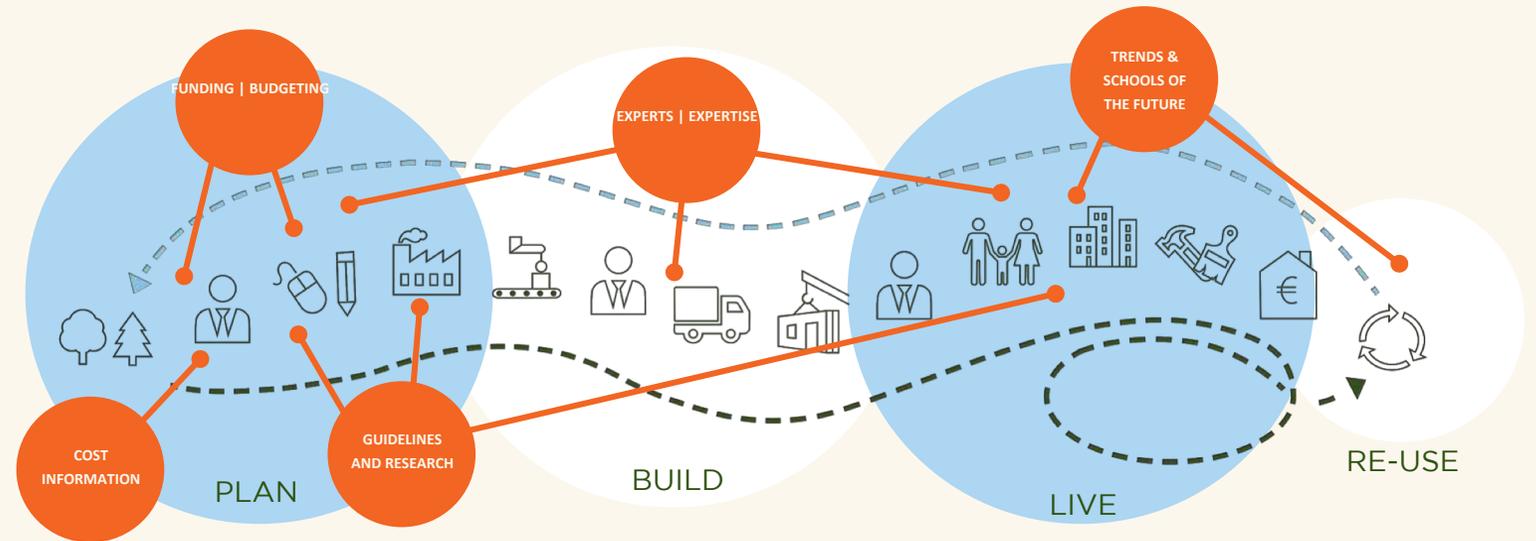
STEERING DECISION MAKING TOWARDS BETTER MATERIAL CHOICES

PUBLIC FUNDING PROCESS DEFINING INFORMATION NEED

Budgets are appointed for projects early on largely depending on materials of the structure. Specific **products are often chosen with what is left in the budget** after the biggest expenses have been cleared. With the overall budget in mind, balancing aesthetics, quality, durability and cost is often the responsibility of the architect alone. Politicians are, and should only be responsible for budgeting with adequate information catered to them to base their decisions on. Municipal spatial services are responsible to compile and present this information to the decision makers as the foundation for making informed decisions on funding. The information provided includes specifications on materials and products and is often compiled with the help of external consultants, experts from different fields.

EXPERTS | EXPERTISE

Experts are important, trusted entities for municipalities. In the best case scenario they are used in every area possible: procurement, design, cost calculations, technology, safety, education, materials etc. The existing expert network should be activated efficiently and at the right moment in order to support life-cycle thinking when it comes to materials and building types. Establishing a support network of experts for planning healthy and safe educational spaces would make use of the available expertise, would support channelling feedback to professionals and projects easily and subsequently support the experts in their work.



The impact of different topics on the whole life-cycle of a building.

GUIDELINES AND RESEARCH

Guidelines and research for planning educational spaces have been published by several different entities. They are perceived as needed and beneficial by the organisations creating them, but no feedback is gathered of their usefulness. It is not clear either, whether all stakeholders for whom the information would be helpful to find these documentations. Promoting the existing guidelines and current best practices has potential in helping the industry evolve overall. Developing these guidelines further according to feedback from their users would reinforce their usefulness. Finding the right level of detail of information, an appropriate channel and a suitable tone of voice has potential to help convey the right information in the right way.

TRENDS & SCHOOLS OF THE FUTURE

Recommendations for designing “[phenomenon based learning](#)” environments have introduced user needs in the centre of design briefs, but also overwhelmed stakeholders involved in these types of building projects. Amongst several other aspects to take in consideration, materials are not taken full advantage of in most cases. Material choices can help users adapt to new types of learning environments when done right. Furthermore, designing buildings that can adapt to different uses can lengthen the lifespan of a building. **Follow-up research on how new types of learning spaces affect the users** could be done to support future projects. Material producers could help municipalities to reach full potential on choosing materials to be used in innovative ways.

BENEFITS OF GATHERING PROOF & REFERENCES

CURRENT PROCESS FOR APPROVAL

Interviewees mentioned proof of suitability and previous use as essential for materials to be chosen for public building projects. The easier information on durability, usability, installation and construction and life cycle costs is to acquire, the better chances the material has to be approved for use. The gathering of this type of information to be presented to decision makers accounts largely on the personal ambition levels and personal interests of stakeholders involved. Until now, it seems that people have had to make an extra effort to gather proof of innovative and sustainable materials to be convincing in regards of safety, health and cost-efficiency.

SHOWING EXAMPLES AND PROOF

A great example on benefits of proof is the first day care in Helsinki built from CLT wood that opened the door to [two more similar projects](#). Information of existing projects which can convince decision makers and should be compiled and delivered in a format that is easy to distribute. Proving that materials are in widespread use by several construction professionals will also build further confidence on their reliability.

One challenge for stakeholders involved in building projects was mentioned to be the lack of evidence in how to combine materials. Companies could proactively offer this information to stakeholders in collaboration with other producers.



It was a small project but it opened the door for bigger ones.

Architect.

The material was chosen for the building project after extra effort was put in into gathering proof of a materials proficiency by the architect. After the first reference case the municipality approved several more new projects within one year to be built from the same material.

RESEARCH AND MONITORING

Displaying proof from research has been successfully used for steering municipal decision making in building projects. Research studies by external consultants are commissioned especially in renovation projects with good results in gathering needed proof for going forward with technologies or materials.

The city of Vantaa showcased good testing results in using a new type of flooring material in a small test space to give validation for the material to be purchased for an entire new school. The flooring proved healthier in regards to dust affecting the indoor air and thus beneficial to be adapted to a larger space.

Monitoring building performance can also be used as proof of benefits. This may be done through studying long-term effects and gathering proof from data but also through smaller scale investigations (e.g. indoor air). Data gathering seems to be done only to some extent and results are not used to full potential. User feedback related to educational buildings was also mentioned as a potential point of gathering proof and examples of good solutions.

CONTRACT MODELS IMPROVING COLLABORATION

The alliance contract model has improved collaboration and communication between stakeholders according to all interviewees. Quality of building has also benefitted from the model. One interviewee mentioned the need to document the positive progress

achieved to show as proof and to enable further learning. The next step could be to use a life-cycle contract model to elevate life-cycle thinking in the industry even further. The interest for this model is apparent, but has not yet been tested in an educational project in the municipalities related to the interviewees.

INNOVATION

Lack of innovation in public building projects was accounted to the pressure to build quickly with using known methods. Room for innovation is slim, when budgets are set early on and material proof requires extra work. Catering material information could enable designers to spend more time on finding innovative and clever solutions to present, as well as engaging users more in the design process. Furthermore, offering proactively solutions to sustainability challenges wherever possible, might have the biggest impact in creating the best educational environments for future generations.

SCALING UP BEST PRACTICES IN EDUCATION

While Finnish education and early education have been concepts that have gained interest in international forums, the role of architecture and spatial design have not been highlighted as part of a holistic concept. Research and proof of the impact of an environment as part of delivering learning results could promote the importance of spatial design and materials as part of the bigger whole.



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