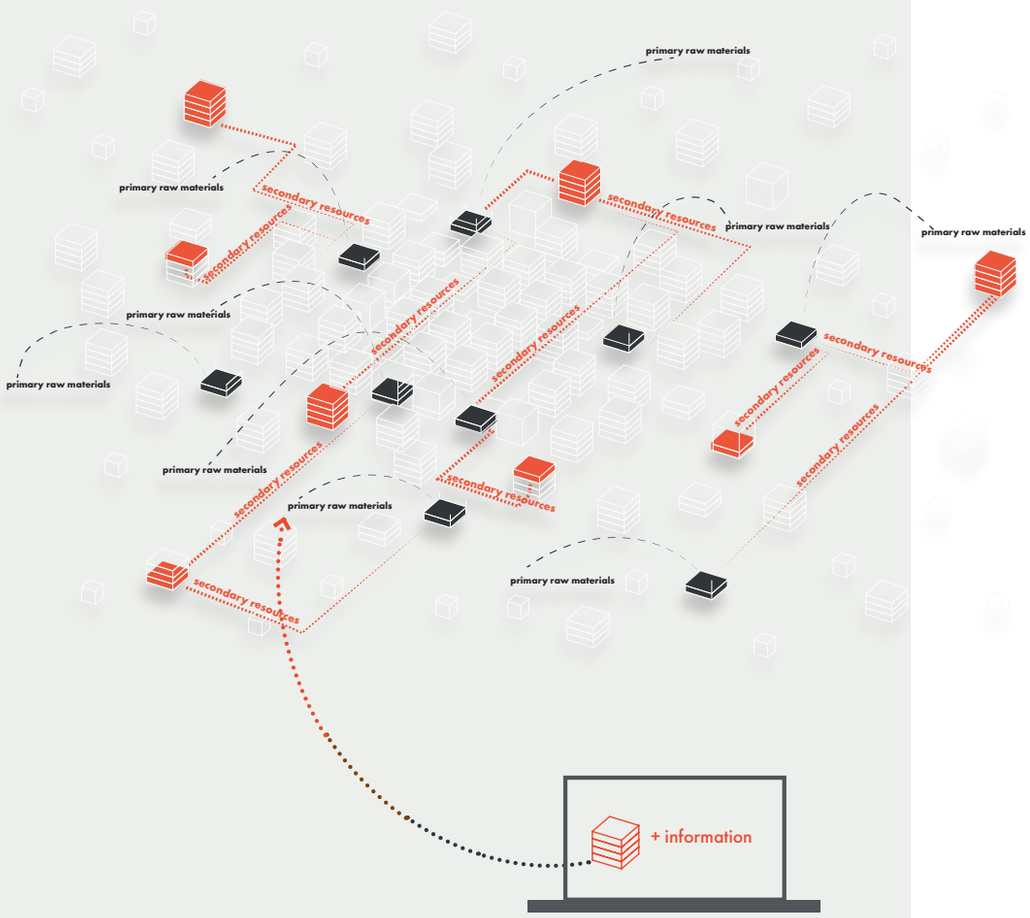
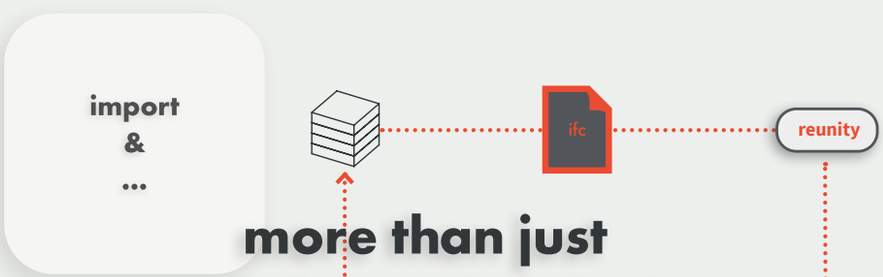
reunity

why reunity ?

If you look at modern cities the need for sustainability, networking, connection of processes is evident. The main issue is an increasing unused anthropogenic deposit of resources in cities and at the same time an increasing global sacarcity of resources. Every day tons of our dwindling resources are used in our cities without a controlled material flow management system. This leads to an ignorance surrounding useful resources and reinforces the lack of secondary materials trade transparency which labels recyclates as an unrelieable and not forseeable resource. The circular economy in the building industry is still in its infancy and its translation in design process not clear to everyone. The aim is to provide a digital software ecosystem to decrease the lacks of transparency and to visualize and support the dependencies of sustainable management within the construction-project. Starting with Information design previously invisible information becomes transparent and tangible through appropriate data visualizations. This helps to minimize the inherent complexity of resource management and construction-projects. The software ecosystem „reunity" includes 1) materials management 2) recyclability 3) carbon footprint 4) material passport. „reunity" lays the foundation for a new value creation logic in the architecture and inner-city materials management. The data-based approach helps to preserve, obtain and improve transparency quality.





more than just information design...

we think with you about your ecological footprint!

why reunity

materials management

recyclability

secondary resources

material passport

carbon footprint

import & share

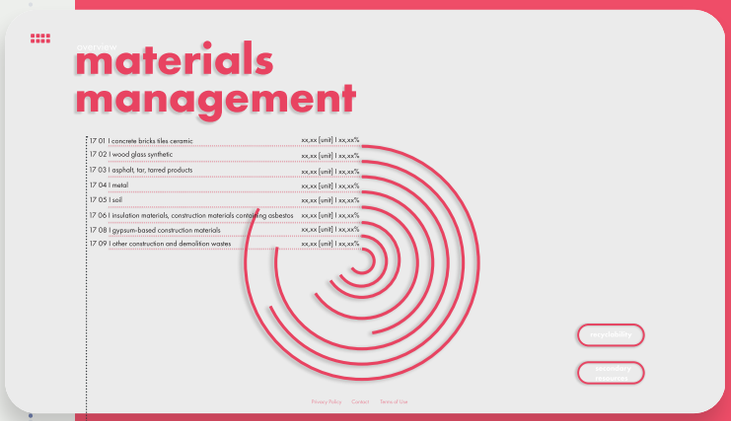
project information

dont°t be superficial

know what°s inside

materials management

After importing the IFC-file into the software, the user has the possibility to get information about the material management of the planned building. For the information presentation „reunity“ does not take over the categorization according to cost categories (here: DIN 276 Germany) but takes over the systematization of the building materials according to the European wasting-list. This list is the basis for the material management of the German recycling companies. The classification can be adapted to the systematization of raw materials of each country. With this new categorization, the interface between planners and recycling companies is established. After the completion of the construction the digital twin contains all relevant information (quantity data, material data, time of use, type of construction), the project manager can upload the model to the „reunity“-community. The recycling companies directly receive all relevant information and can plan, process and handle future material flows more accurately. The more information is integrated into the software, the larger are the material flows. An inner-city materials flow management system is created.



categorization according to the material management of the recycling compnies, here: European waste-listing

most of the time...

design process ▸▸ how to

with **reunity**

design process
+
open data management supports recycling companies

import & share

Let°s build citys, together.

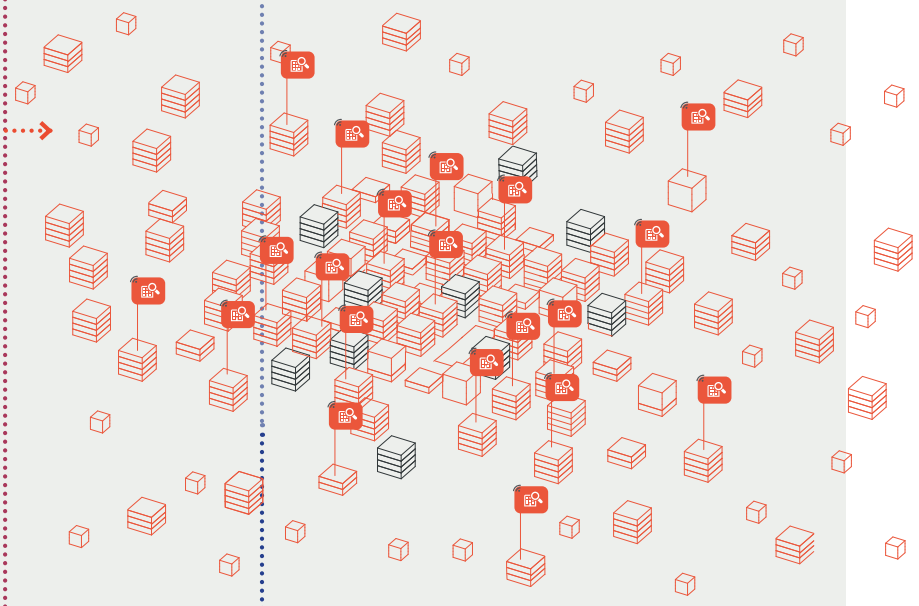
inner city materials flow management

ifc

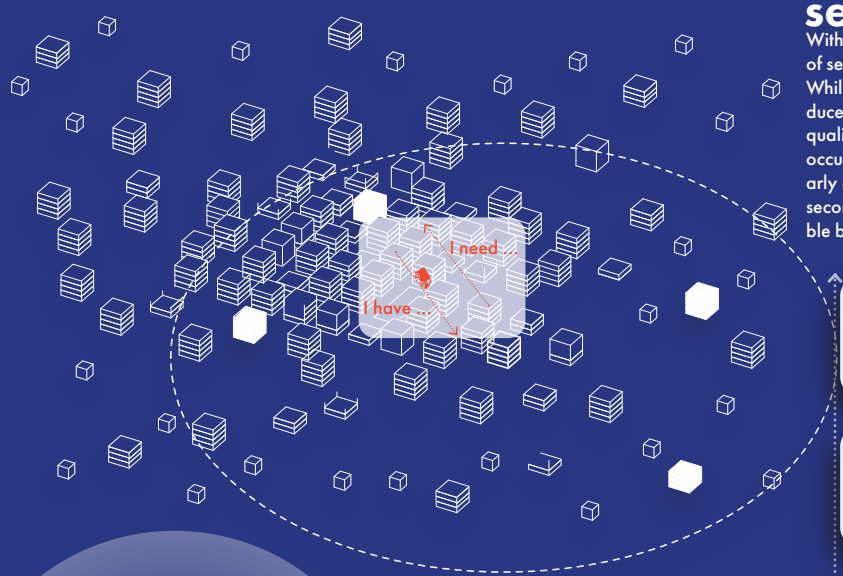
reunity

share !

Once approved, „reunity" updates the digital inner-city resource inventory in the community and recyclers and (future-) planners receive detailed information about secondary raw materials that will be released in the future. The current urban building inventory can also be subsequently fed into the digital network. The intention is to have knowledge about the used materials in every single real estate in the cities. With every shared digital project and its information, the knowledge about used raw materials grows and enables the increasing success of using the city as a controlled Urban Mine.



controlled urban mine: prerequisite for a trade of seondary resources



secondary resources

With the help of a functioning urban mine, the success of secondary raw material management is growing. While construction companies and raw material producers can make reliable information about quantity, quality and delivery time, recycled materials tend to occur spontaneously in quantities that cannot be clearly calculated. „reunity" offers the possibility to use secondary resources as well as plannable and reliable building materials.

project 1

project 2

project 3

project 4

I use it !

also search by yourself!

Bahnstadtchausee 1
streetname (construction site)

Opladen, Germany
location (construction site)

support structure
structural compoment

wood
material type

- none
physical requirements

- none
fire protection requirements

- none
healthcare

01-03-2021
availability date

- none
radius search

just **10%** of the construction can be reused

why?

increase !

reunity found following projects and products

high recycability

high quality of secondary raw materials trading

why recyclability?

A prerequisite for successful secondary raw materials trading is a high degree of recyclability of the materials. As researches have shown, material recycling as well as product recycling is essential. For successful product recycling, selective deconstruction with the preservation of unmixed and undamaged products is fundamental. Selective deconstruction can only be successful through reversible design. To support this, „reunity" checks the planned constructions of the digital building for reversible and irreversible joints of the components. The user gets shown own planned construction details with specific possibilities for optimization in the digital twin at the push of a button. To optimize material recycling, „reunity" increases the recycling degree by comparing planned raw materials with the raw materials contained in the material database. Here, homogeneity is the goal as well as the necessary connections of the materials in the building bodies themselves. Only if necessary properties are not minimized, „reunity" shows spezific optimization suggestions from the material database.

just

30%

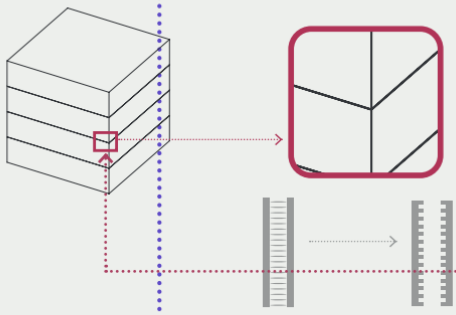
of the your planned construction can be reused

ATTENTION !

For other construction points we propose following materials (material passport). Use one of these and you are able to plan a reversible construction.

Check the requirements. No change.

At the following construction points you can turn irreversible into reversivle joints of the components.



improve !

use and

reduce!

carbon footprint

you produce

XX kgCO2

decrease!

secondary use

material passport

Throughout the planning process, „reunity" constantly calculates the carbon footprint of the construction project and visualizes it to the user. The digital ecosystem constantly pursues the goal of keeping the carbon footprint as low as possible, but without compromising quality. The different possibilities to minimize it are automatically and constantly offered to the user during the whole planning process.

use and reduce!

The material database gives the user easy access to all sustainable materials with or without quality seals, such as „cradle to cradle". The materials are categorized by components (exterior walls, internal wall, ceiling, insulation products, sealants, and more). Both primary and secondary raw materials are offered. The secondary raw materials are automatically taken from the „reunity"-community. Furthermore, companies are given the opportunity to place their building materials directly with „reunity". Since the digital ecosystem strives for a high degree of sustainability and high quality in all construction projects, the companies must comply with given requirements (e.g. healthcare) and guarantee the sustainability aspects.
When selecting a product, the user is automatically shown the optimization potential of the carbon footprint and sustainable aspects he can achieve with this material. At the same time, „reunity" checks the material from the database against the planned product and shows all differences, especially physical properties and joining variations.
If the user is convinced by the proposed product, he will receive a direct overview of the required quantity and associated costs at the push of the button.

material passport

search | exterior walls | internal walls | windows

ceiling | insulation products | sealants | more...

streetname (construction site)

location (construction site)

structural compoment

material type

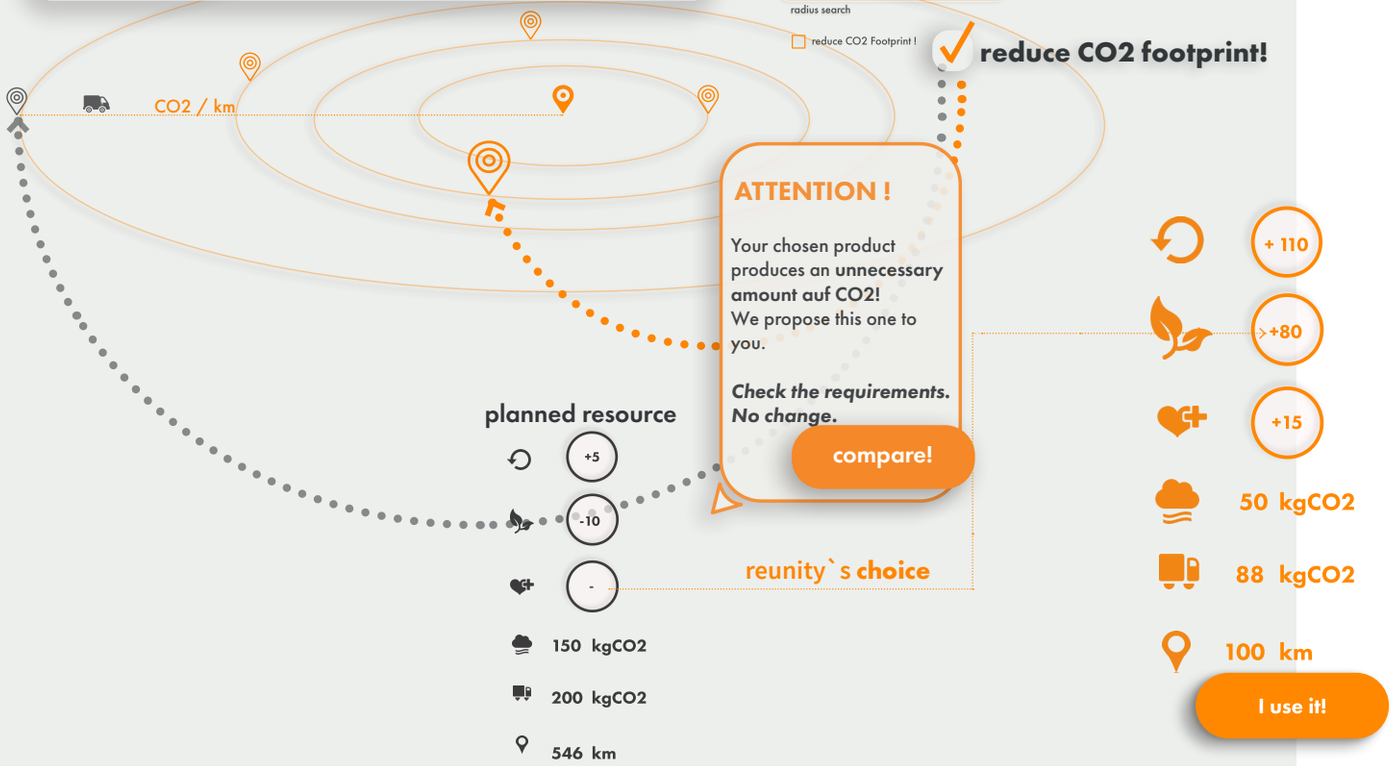
physical requirements

fire protection requirements

healthcare

availability date

what are you looking for?



sharing is caring

- easy use
- smart use
- huge impact

a human-centered and purpose-driven software

reunity

ressource ° community

sarah schuhmann
Faculty of Architecture
University of Applied Sciences Cologne
January 2021

citydesign2020

„reunity“ - the digital ecosystem