

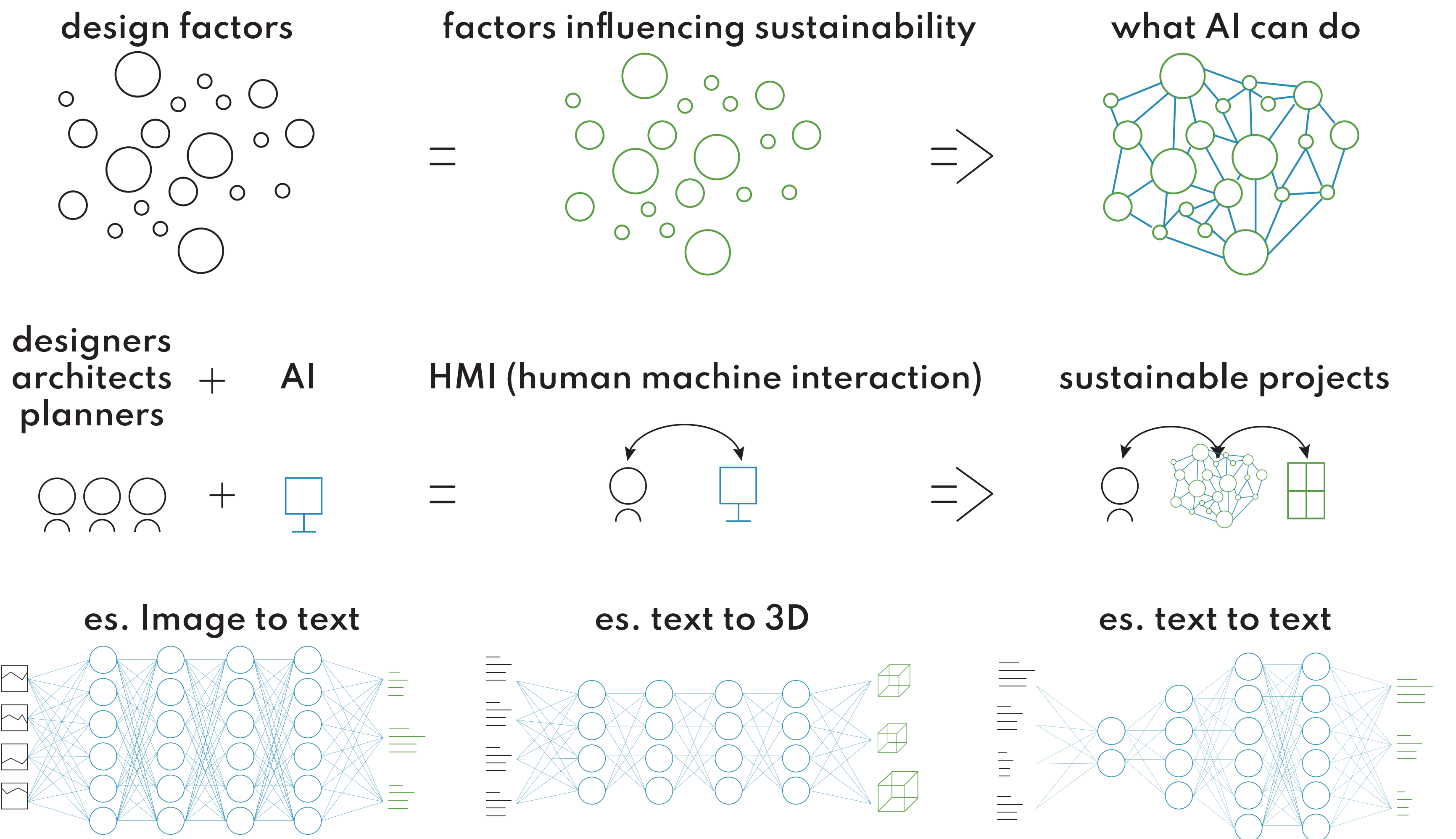
Foreword & assumptions

This research is part of the field of reflection on the role of new technologies in design processes, in terms of cognitive tools and models, with particular reference to the use of artificial intelligence.

The aim of the research is to assess how AI can bring design value by studying the cognitive interaction that takes place between this technology and designers, architects, and planners.

Specifically, the purpose is to assess this interaction in relation to the complexity of sustainable design development.

AI models differ in learning methods, datasets, the inputs they require and the outputs they generate, etc. For this reason, they can be useful for different design steps.

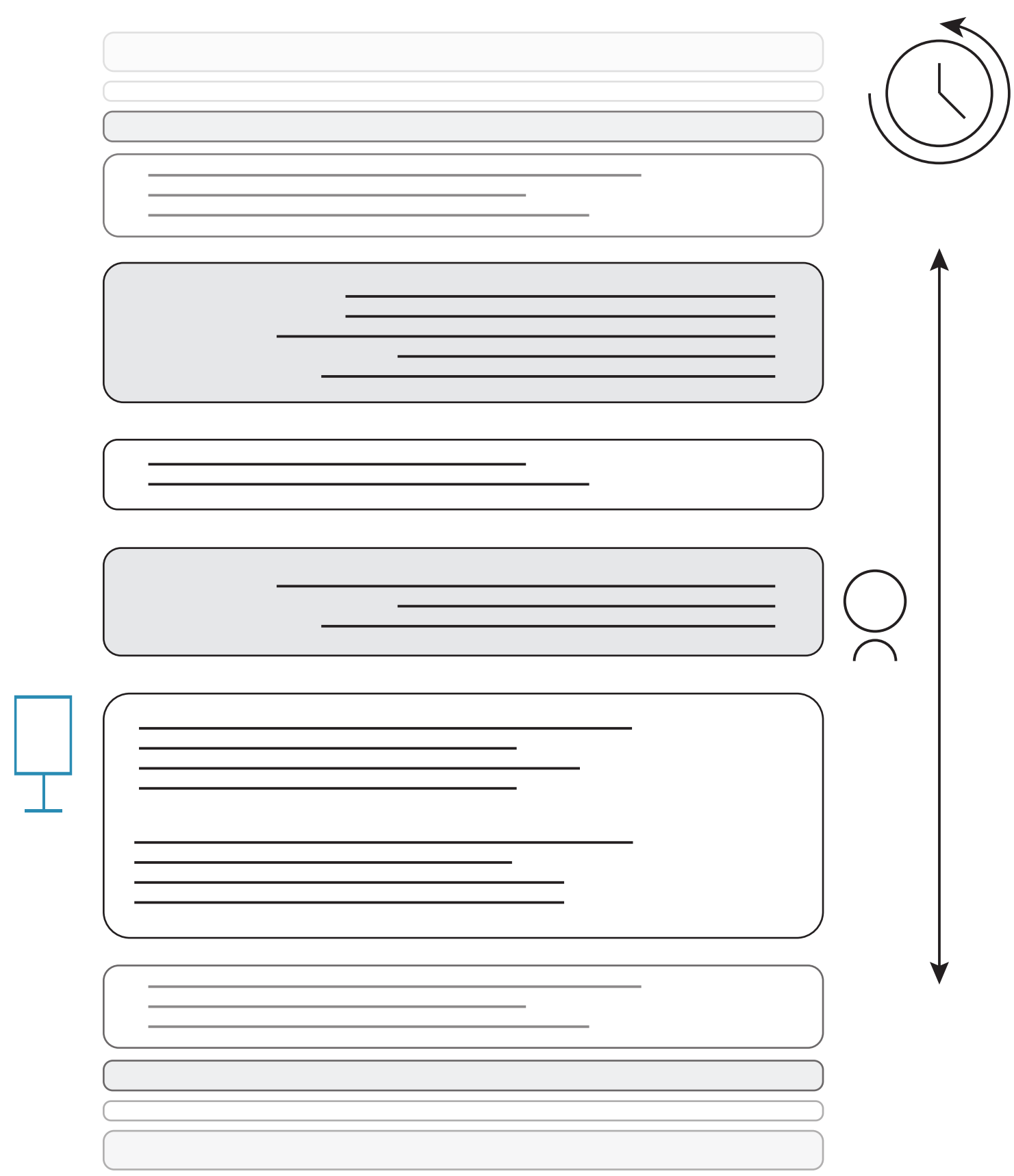


Methodology - analysis

First, an analysis was made of the AI platforms available online. next, I researched AI software that allows processing data through low code or no code, in order to develop designs.

1 CONTINUOUS FLOW

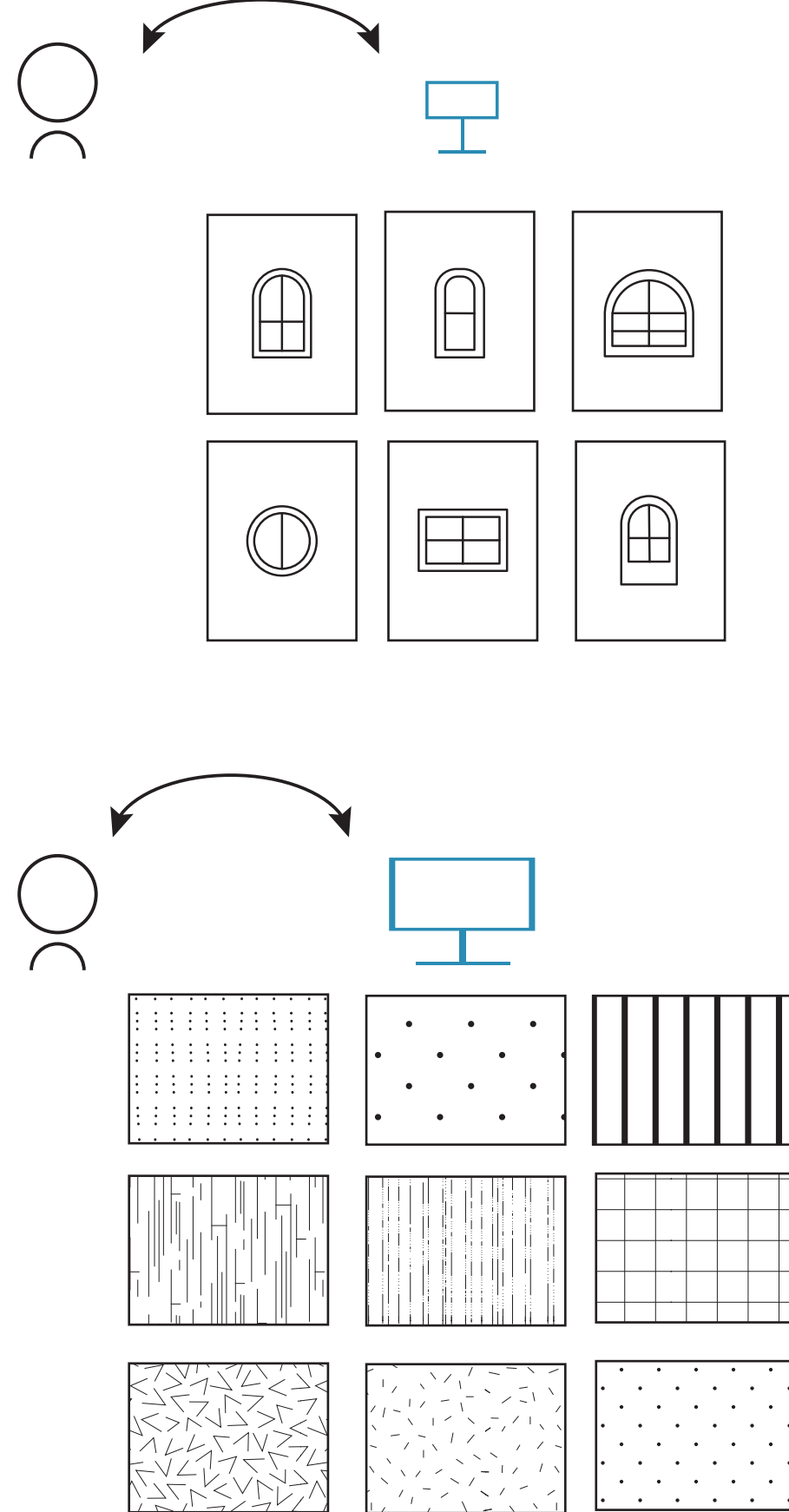
Interaction that continues over time through projects and years.



e.g. Research on materials, request for explanation of construction procedures, questions on sustainable implementations, reports on ISO standards

2 SPOT QUERIES

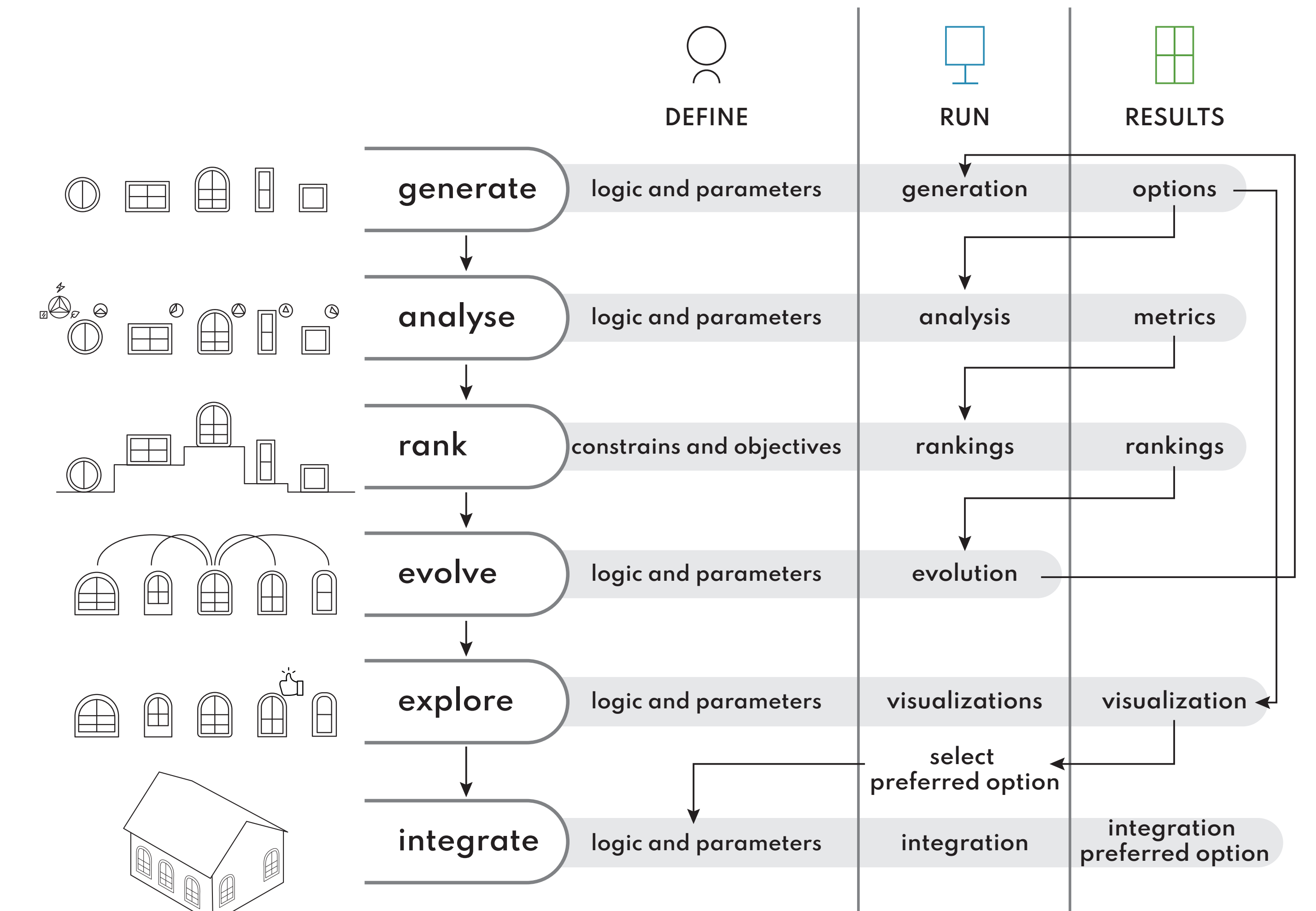
Sporadic interaction with different models.



e.g. Preliminary research and moodboards, concept elaboration, material textures, punctual and unforeseeable requirements.

3 PROJECT DEVELOPMENT ASSISTANT

Interaction with a single software with different AI plugins inside that have precise focuses according to project steps



e.g. Support for each parameter to be entered and decision to be made, useful for companies producing the same category of objects.

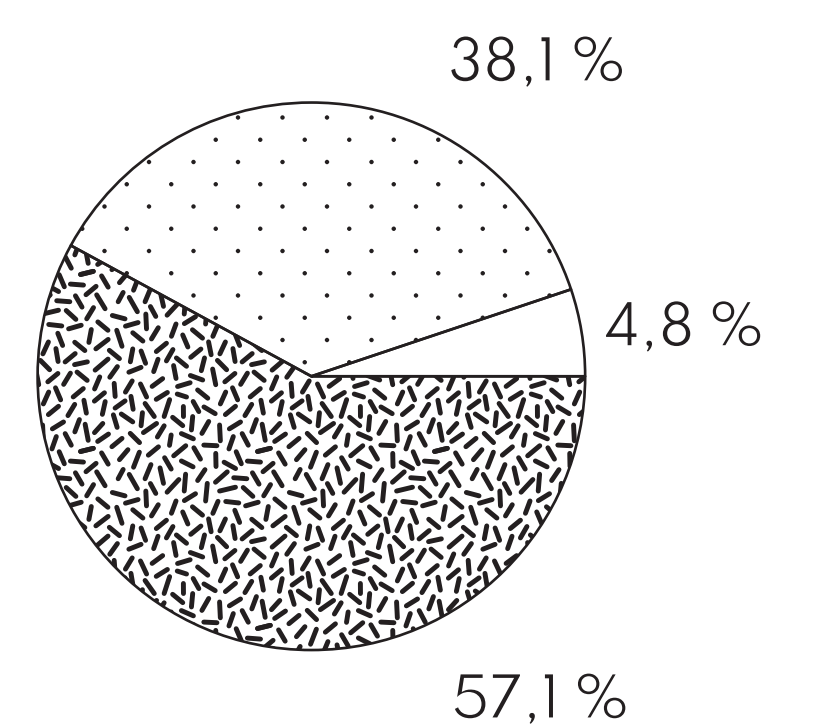
The chart refers to a diagram found on the website: <https://www.generative-design.org/>

Methodology - preliminary experimentation

A second step was to develop two workshops with students from the Iuav University of Venice. The students had to use Lexica.art - as sporadic interaction - to generate images from their own textual elaboration, developed from group reasoning and concepts. These were useful to develop an initial mapping of the AI model - design student interactions, through a questionnaire and direct observation.

Did you write the prompt as you would ask a person to make the device or more like how you would write a Google search?
21 answers

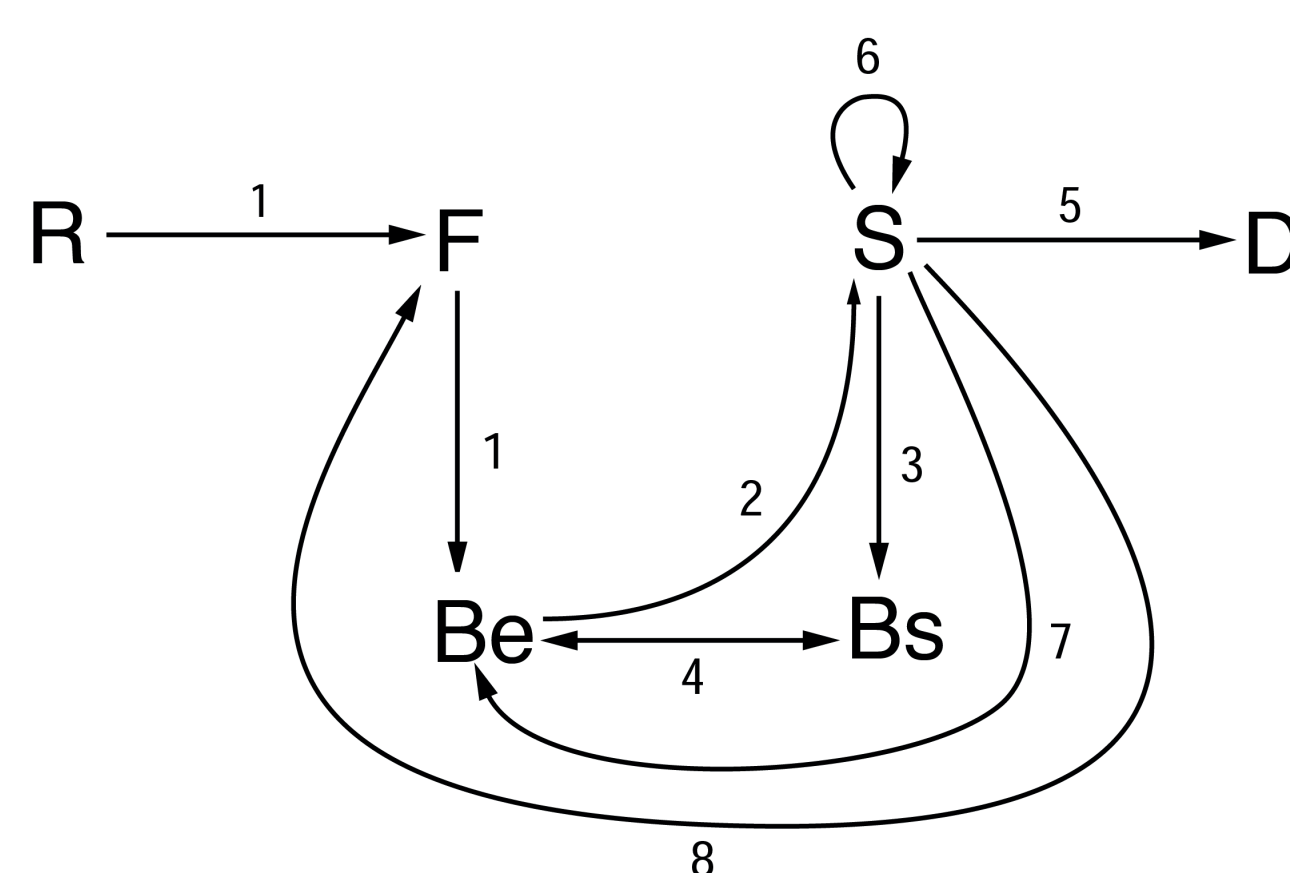
38,1% How to ask a person
57,1% How to ask the search engine Google
4,8% Somewhere in between



Next step

Data will be collected by testing AI platforms available online and the three prototypes developed, according to these methodologies.

- semi-structured interviews
- questionnaires
- on-site observations during custom-designed workshops to analyse a single phase of the project process. Possibly using the FBS (Function/Behaviour/Structure) model to verify whether it is appropriate for this type of analysis. This model was chosen because it is a well-established method for acquiring thinking data from verbal reports (Ericsson and Simon, 1993). It has also been widely used in cognitive and behavioural studies of designers (Bilda et al, 2006; Ennis and Gyeszly, 1991).



Be = expected behaviour
Bs = behaviour derived from structure
D = design description
F = function
R = requirement
S = structure

→ = transformation
↔ = comparison

Objectives

Understand whether the three types can be used to implement sustainability specifically and how designers interact with them.

Comprehend which aspects need to be implemented to achieve optimal interaction and reliable results from the models.