



Strategy for the diffusion of BPS in Arup's workflow: A design thinking approach

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Background

While Building Performance Simulation (BPS) is recognized as a high-potential tool to improve the built environment by making informed decisions throughout the design process, its utilization in practice is impeded by barriers of diverse nature (technological, social, financial...). Additionally, there seems to be a gap between the needs of building designers and engineers and the solutions for better use of simulation provided by the outcomes of academic research projects. By looking at the problem of simulation utilization from the user perspective and with the constraints of practice in mind, this project focuses on answering the needs of practitioners and the obstacles they meet when using or wanting to use simulations.

Arup is considered as one of the most forward-thinking firms in the field of building engineering. Arup has been consulting engineer for many iconic projects with exemplary use of simulation, but they also do more mainstream projects that use little or no simulation. This project aims at providing Arup Amsterdam with a view on how to bring the best solutions to their different clients.

Aim of the project

The ultimate goal is to assess how to reduce the barriers to valuable and profitable use of BPS in building design from Arup Amsterdam's MEP and Building Physics team by proposing a strategy that fits in Arup's workflow.

Method

This PDEng design project follows a design thinking methodology.

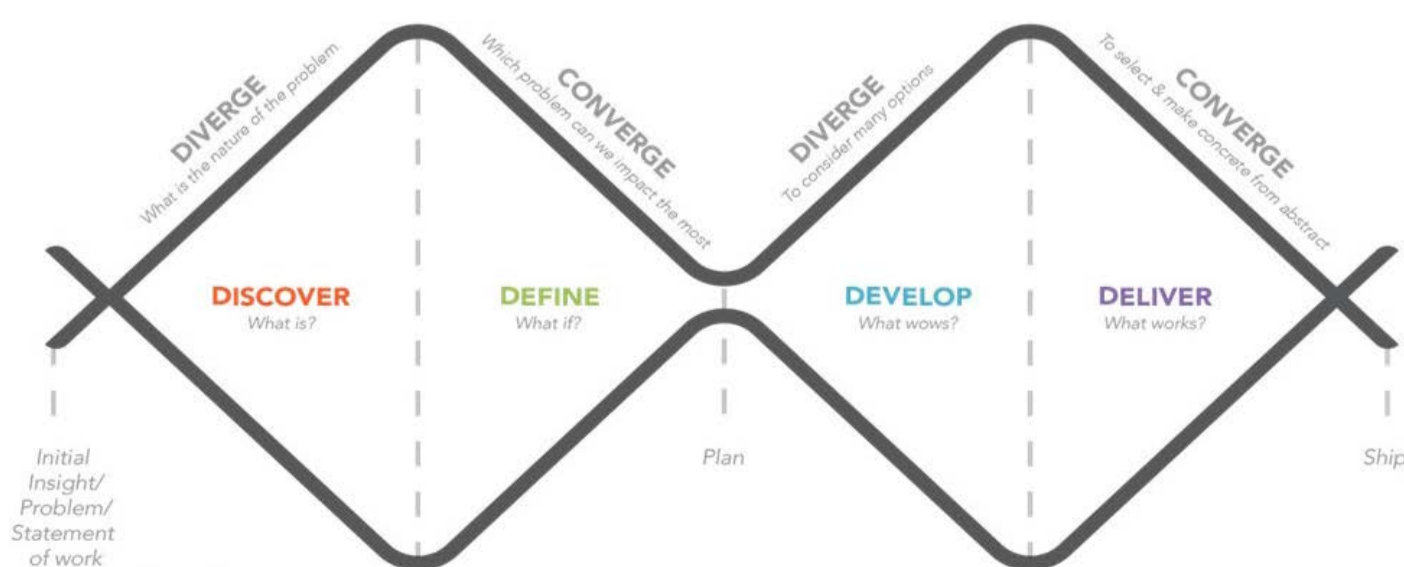


Figure 1 – Design thinking approach diagram.

More precisely, it uses the divergent-convergent method which aims at first understanding the problem and its context in all its aspects (divergent) to be able to precisely define the area of intervention of the solution (convergent). This then allows to generate many on-point ideations (divergent) to finally select and test the best solution (convergent).

Design solutions

Based on the Discover and Define phase the following products are to be developed for this project:

“Simulation cards”

Some of the identified problems include the lack of awareness or communication of the latest development in the field of building performance simulation, the lack of resources and time available to perform these simulations during the design process and the lack of incentives from the client or the building regulation. It was assessed that in most cases this could be solved by taking the time at the beginning of each project to identify the need for simulation with the help of “Simulation cards”.

These cards should help the project manager to :

- Identify, as early as possible in the design process, potential problems or complexities in the project that could be solved by means of simulation.
- Pro-actively propose the use of simulation to the client to bring more value to the project.
- Correctly allocate time and human resources on the project to have a successful utilization of simulation.

Tool improvement

It was also discovered that an existing tool developed within Arup was not being used for various reasons: no direct need for it at the time of development, difficulties to operate the tool, overlap with existing methods, lack of testing of the tool... This PDEng brings the opportunity to modify or extend the tool to improve its usability and adoption by the concerned experts. The improvements should focus on the needs of the users such as: ease of use, impact on design process, facilitation of review for quality control and visualization of results.