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## An assessment of user-driven innovation methods

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AN ASSESSMENT OF  
**USER-DRIVEN  
INNOVATION  
METHODS**



The InnoDoors project is designed around the door manufacturer JELD-WEN Door Solutions and partners from the entire value chain of this company. The project creates a collaborative approach to how to exploit potential for growth through user-driven innovation. The project is supported financially by the Danish Enterprise and Construction Authority – programme for Userdriven Innovation.

The project runs from 1 October 2009 until 31 December 2011.

The partners involved in Project InnoDoors are:

JELD-WEN Door Solutions, Optimera, Henning Larsen Architects, INWIDO DENMARK, HP3, Abson, DI Byggematerialer, SmartCityDK, Center for Industrial Production (Aalborg University), Department of Architecture Design and Media Technology (Aalborg University) and Department of Mechanical and Manufacturing Engineering (Aalborg University).

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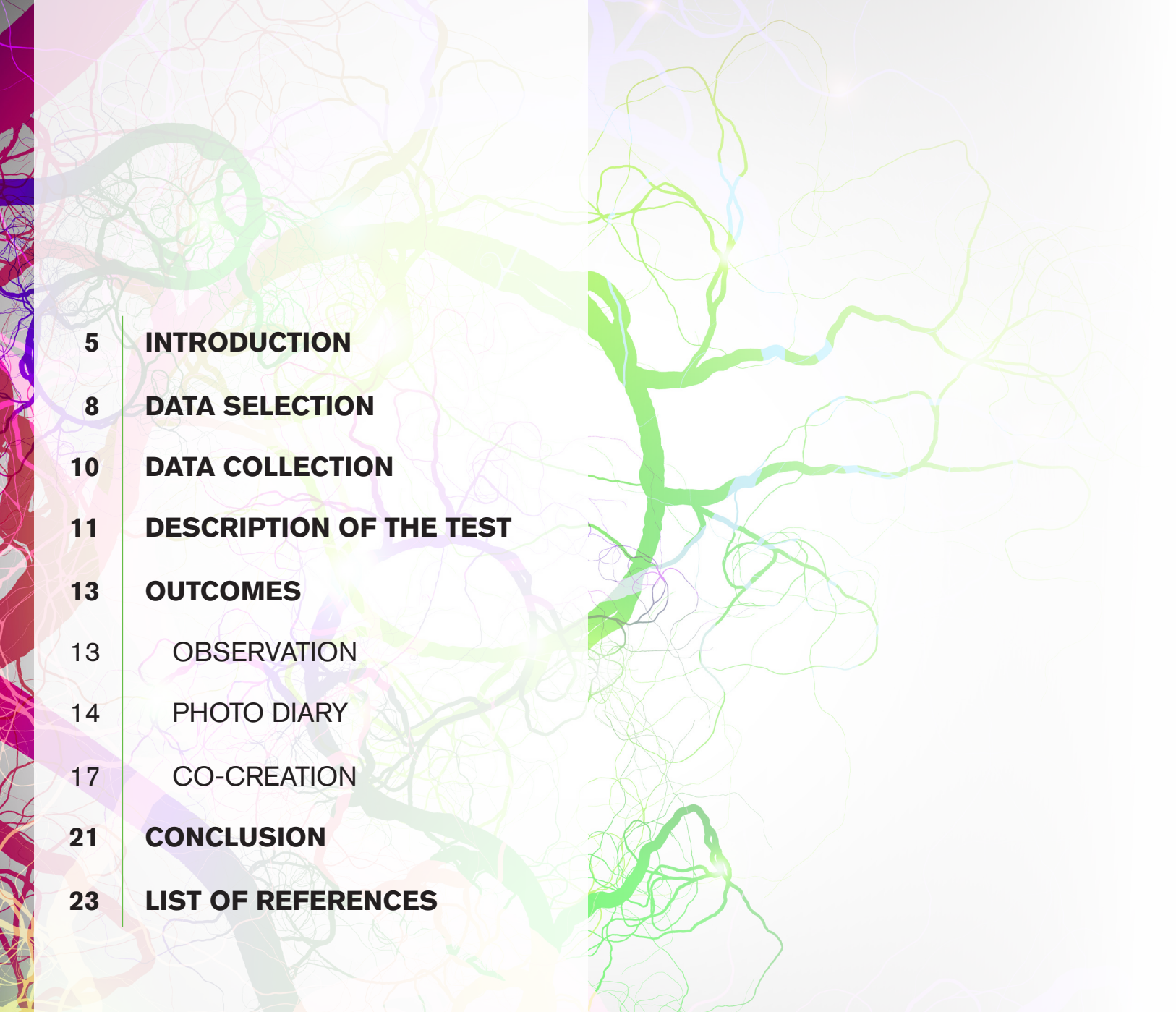
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# Introduction

Project InnoDoors mainly focuses on enhancing the level of innovation in the Danish construction material industry. Whilst many initiatives have been set forward by the Danish government, none of them have been able to fully live up to their potential. Most of the initiatives have been introduced on a single company level, however, market dynamics, traditional manners of conducting business, high level of interdependence amongst value networks, tight trade union agreements, and little insight into the users and their needs, all initiatives have led to the notion that innovation initiatives in the construction material industry need to be conducted on network level rather than on single entity level.

Working on entire network level requires a common standpoint, a common goal, and a common strategy – all of which the end-users of the construction material industry products constitute. As such, Project InnoDoors introduces and implements user-driven innovation in a supply and network perspective.

The project is structured around a large door manufacturer and its entire supply and value network, including suppliers, retailers, architects, designers, competitors, contractors, construction material communities and trade unions, and academics specialised in the three areas of architecture and design, production and business processes, and construction management.

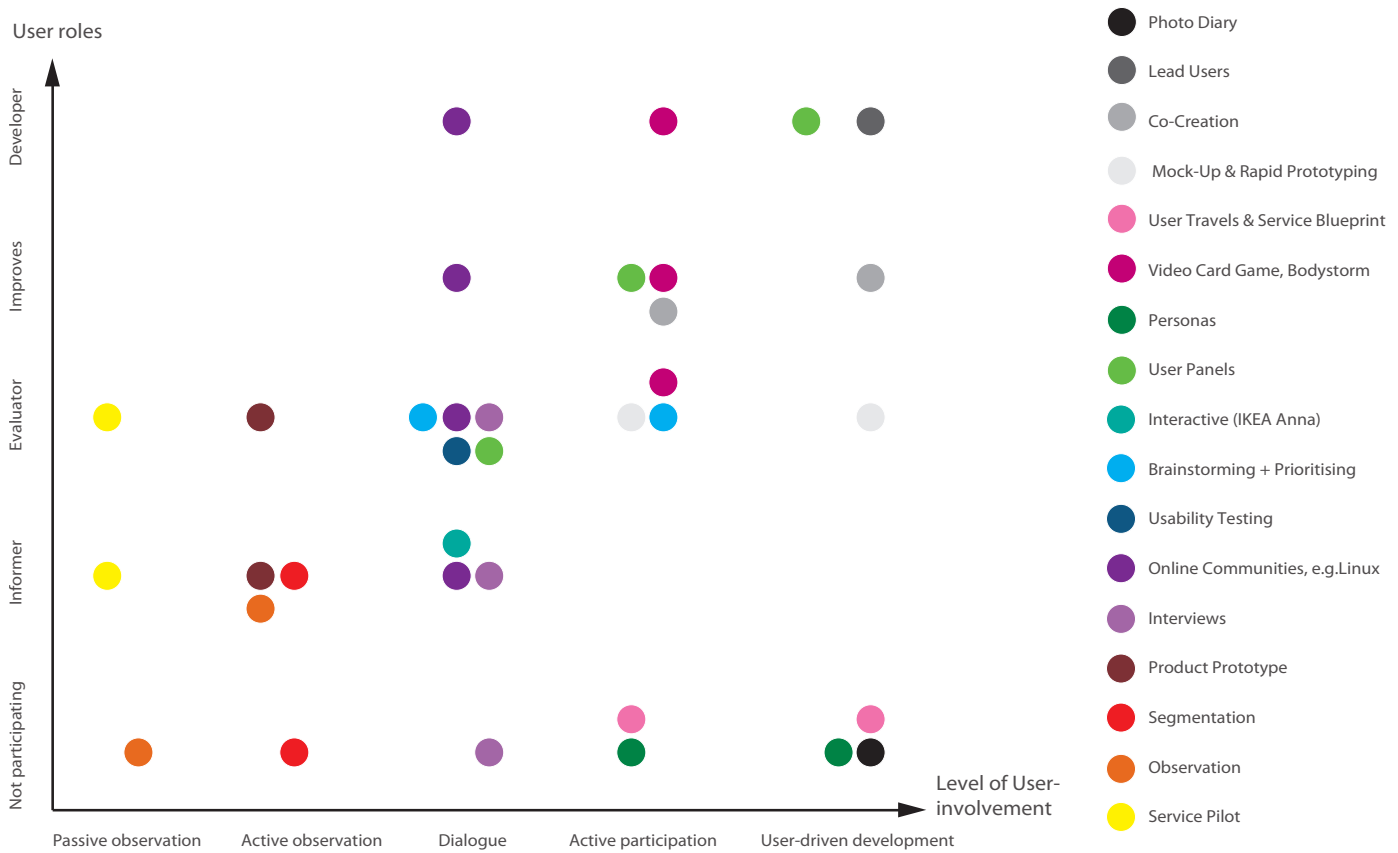
This publication serves to test a number of methods that have been presented in the 'method-graph', which was created in connection with Project InnoDoors. The primary function of the test will be to further improve the 'method-graph' by refining and advancing some of the user-driven methods that are described in it. Also, the methods that are tested are evaluated in terms of their usefulness and effectiveness in terms of gaining user data and analysing the output that is derived.

The test described in this publication will be conducted on three different methods and will be evaluated in terms of:

- The amount of information that the method can generate
- The type of information that the methods generate
- A comparison between the actual outcome of the methods and the outcomes promised in the 'method-graph'.

The method-graph was first presented in July 2011 as an illustration of different kinds of user-driven innovation methods (please refer to the publication of: 'User segmentation – from customer focus to user focus, Jacobsen et al., 2010). The graph and methods have been demonstrated in terms of 'role of user' and 'level of user activity', originally developed by Merit and Nielsen (2006). The 'method-graph' can be viewed in the illustration on the next page:

FIGURE 1: THE METHOD-GRAPH



In measuring 'user roles' Merit and Nielsen (2006) defined a total of five levels:

- Non-participating: the users play absolutely no role in the development of e.g. a new product/service.
- Informing: the users become part of the development process to a little extent. This could e.g. be by being part of an interview and answering a number of questions. As such, the informing user does not prepare anything beforehand.
- Evaluating: the users take an active approach in evaluating the already compiled product. Thus, even though the users have not been part of the first part of the development process, they may become part of the end part of the process, spanning from e.g. evaluating a mock-up.
- Improving: the users become a greater part of the development process by not only expressing their opinion, but now coming up with solutions themselves. This could e.g. be through a co-creation process.
- Developing: the users have more or less full control of the development process. This could be through e.g. being part of a group of lead users.

In measuring 'the level of user activity', Merit and Nielsen (2006) also developed five levels:

- Passive observation: meaning that the users are not part of the development, but are rather 'observed' by the researcher(s).
- Active observation: the researcher is in the beginning stages of actively involving the user. This could e.g. be by answering clarifying questions, etc.
- Dialogue: the user now plays a more active part of delivering data to the research at hand. They are delivering some sort of knowledge, e.g. through an interview.
- Active participation: not only do the users deliver knowledge to the researchers but they now become part in developing a new product/service.
- User-controlled development: this is where the users actually play a bigger part in developing e.g. a new product or service than the researchers themselves.





# Data Selection

The purpose of the test was to assess the usefulness and effectiveness of a number of user-driven innovation methods that were plotted in the 'method-graph'. A total of 20 test subjects were chosen to conduct the different tests, each with the characteristics described in Table 1 on the next page:

The location of the tests was Aalborg University. The test subjects remained at campus for the entire test to ensure comparability of the different tests conducted.

TABLE 1: DATA SELECTION CHARACTERISTICS AND BACKGROUND

<b>CHARACTERISTIC</b>	<b>BACKGROUND</b>
All in the age range of 20-30	This is a group of people that would have the purchasing power of buying doors as well as still being relatively young and being able to think in a modern and 'out-of-the-box' manner.
Do not have experience in using user driven innovation tools	To ensure that the users are not be biased by prior good or bad experience with using the methods, making sure that they are open and interested in testing them.
Have experience in gathering data in general	Even though the users do not have any insight into user-driven methods as such, they do have a general insight into the purpose and manner of gaining data in general. This ensures that the methods are not used unsuitably or improperly.
End-users	The test subjects are (potential) end-users of the product at hand – the door. This ensures that the test subjects have a realistic point of view to gathering data about the product.
They all have the same educational background	To ensure comparability of the different tests.
Have great insight into new product/service development processes	The test subjects know the process and the resources needed for new product development in firms, ensuring that their ideas for improvement of the user-driven methods are relevant in terms of developing new products and services.

# Data Collection

The used data collection tools for the tests were the following:

- Semi-constructed interviews on an entire group level: not only to ensure the individual test subjects' thoughts and ideas of the tests conducted, but to ensure a plenum discussion where more information could be developed and gathered. The test subjects were asked about the usefulness, effectiveness, efficiency, etc. of the different methods that they tested. Also, they were asked if they had any ideas for improvement.
- Video recording: to ensure documentation for future use. Also, to ensure less nervousness of the test subjects, they were told that neither their names nor their voices would be exposed from the video recordings.
- Observation: to gain insight into how they actually conducted the different tests without any disturbance. As such, this would reveal if the methods were as usable and properly described as intended.

The data collection tools used for the test of the different methods were applied by two persons to ensure different aspects of data collection of the same case in the same time. As such, a greater level of trustworthiness was ensured of the upcoming results.

# Description of the test

A total of 20 test subjects were part of the test. The entire test progressed for a total of 4 hours. Prior to the test of the different methods, the test subjects were introduced to the theoretical fields of user-driven innovation in a network setting as well as being presented with the entirety of Project InnoDoors. This would not only ensure that the test subjects gained background knowledge for the test, but they would be able to relate to the challenge at hand of being able to use the different user-driven innovation methods and gain usable pieces of information.

After being presented to the theoretical background and Project InnoDoors, the test subjects were presented to the 'method-graph'. They were told about the background of the model, followed by being presented to the 'method-handbook' related to the 'method-graph'. They were presented with the setting of the test, and were split into three groups, each choosing a method of choice for testing.

The three user-driven innovation methods chosen by the groups were the following: Observation, Photo Diary, and Co-creation. The observing team were asked to assess the usability of a given door, with the purpose of coming up with new ideas as to how to improve it. The photo diary team were asked to take pictures of the different functions a door could have, followed by an assessment of how to improve the different doors. Lastly, the co-creation team were asked to develop 'the door of their dreams'.

Each group was given 1,5 hours to apply the methods, and they would then be able to present their outcome(s) in a plenum discussion in the end.



# Outcomes

The three conducted tests all have their different outcomes – thus, the three tests will be divided in three minor sections in the following.

Firstly, the outcomes of the Observation method will be presented. Secondly, the method of Photo Diary will be described, and lastly, the method of Co-Creation will be presented.

## OBSERVATION

The observation testing team had observed a total of two – one being an entrance door, and one being a swing-door. The illustration below displays one of the test persons drawing and explaining the outcome of observing the swing-door.

There were positive and negative aspects to the method of observing.

On the positive side, the test subjects mentioned the simplicity of actually carrying out the method. Very little preparation is needed, the costs are very low, and a lot of information can be gained in a very short period of time.

On the negative side, considerations of the method were that very little documentation of the outputs was prepared during the observations, as the test subjects found it difficult both to observe any happenings and documenting it simultaneously. Another issue that they mentioned was that they found it 'boring' simply to observe without being able to ask questions to the users of the doors.

As such, the test subjects suggested that this method could be used in the beginning or at the very ending phases of a given research, however, smarter and easier means for documenting the outcomes and how to analyse them afterwards need to be investigated before conducting this method. Also, it is important to discuss exactly what is being observed to ensure that time is spent efficiently.

FIGURE 2: EXAMPLE OF 'SAFETY/SECURITY'



FIGURE 3: EXAMPLE OF 'PRIVACY'



## PHOTO DIARY

The photo diary team were handed two cameras and were told that they could choose to take as many pictures as they wanted of whatever they wanted. The pictures could be related to everything spanning from feelings and desires in general to expectations and use of doors.

The test subjects instinctively decided to take pictures of different scenarios of using different doors with an outset in four different areas: safety/security, privacy, user friendliness, and climate control.

An example of each of the four areas can be viewed above.

FIGURE 4: EXAMPLE OF 'USER FRIENDLINESS'



FIGURE 5: EXAMPLE OF 'CLIMATE CONTROL'



'A picture says more than a 1000 words', which was one of the positive aspects mentioned by the test subjects of this particular method. They felt that it was possible for them to describe feelings towards different subjects in an easier and perhaps more useful manner than trying to describe the feeling or the presence of e.g. privacy.

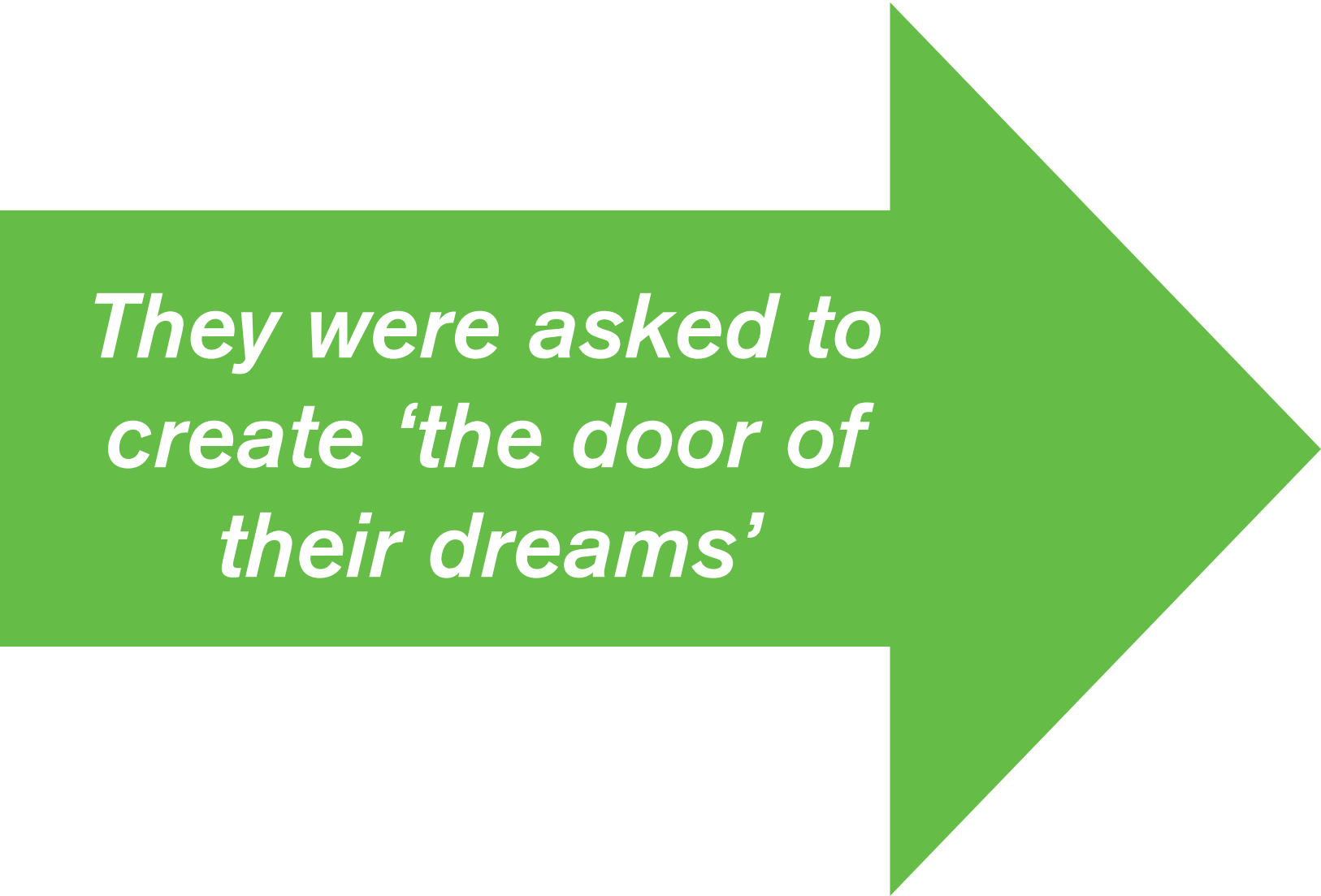
Also, already having a picture at hand helped the test subjects come up with improvements or new ideas of solving problems connected to the picture at hand. The method is easy to use, and a lot of information can be gathered.

Nevertheless, the outcome of the photo diary can be very difficult to analyse unless the pictures represent products that

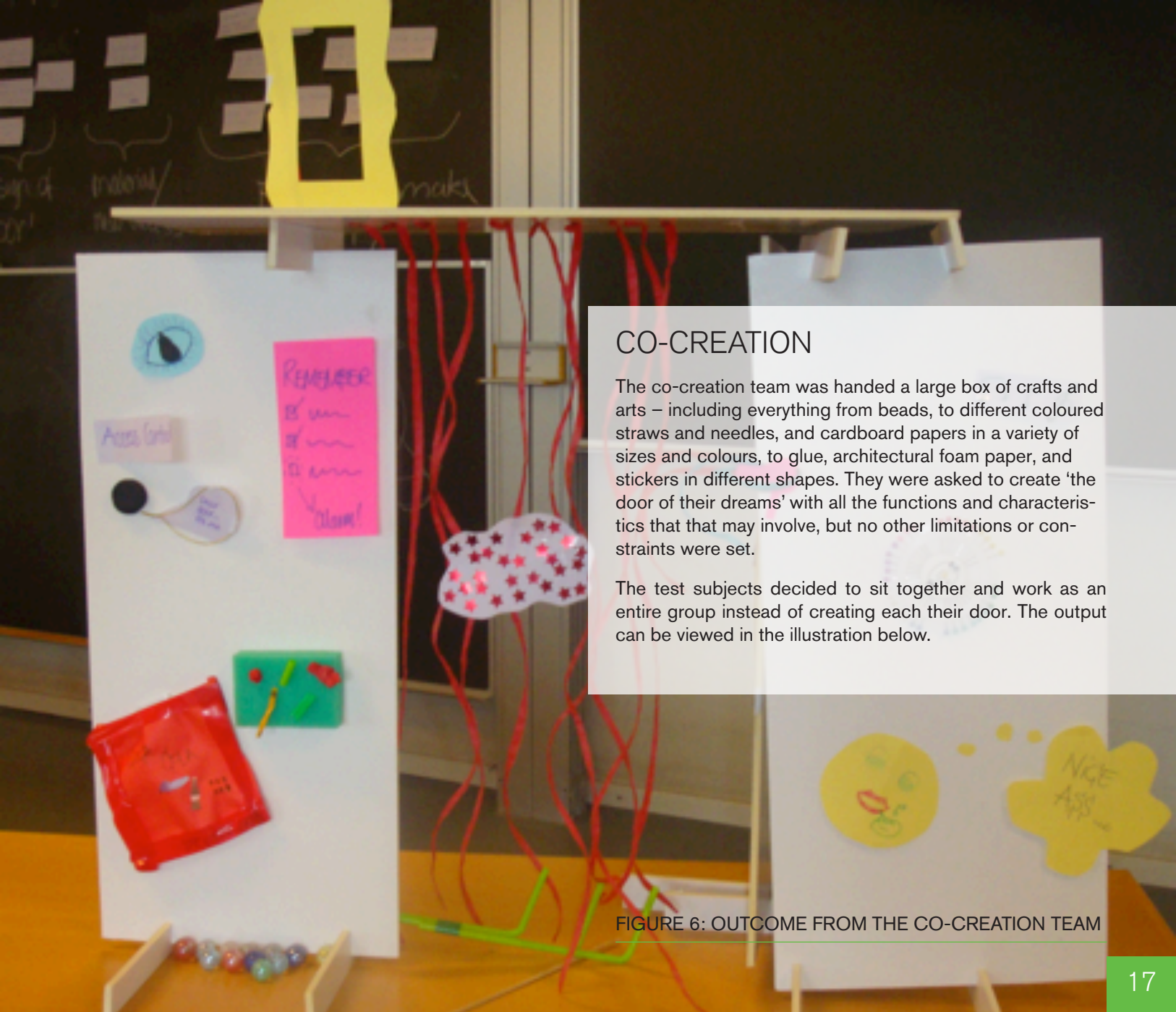
already exist. As with the observation method, the test subjects mentioned the importance of knowing what to look for in a large group of pictures. Also, this method can turn out to be very time consuming, so it is important that the analytical process is as efficient as possible.

Thus, the test subjects found this method highly useful, easy to use, and making it possible to say and put more into the product than they would be able to express in word. However, as with the observation method, the analysis process can turn out to be very difficult, so guidelines for exactly what is needed from the users need to be mentioned, even if it is 'just a feeling'.





*They were asked to  
create 'the door of  
their dreams'*



## CO-CREATION

The co-creation team was handed a large box of crafts and arts – including everything from beads, to different coloured straws and needles, and cardboard papers in a variety of sizes and colours, to glue, architectural foam paper, and stickers in different shapes. They were asked to create ‘the door of their dreams’ with all the functions and characteristics that that may involve, but no other limitations or constraints were set.

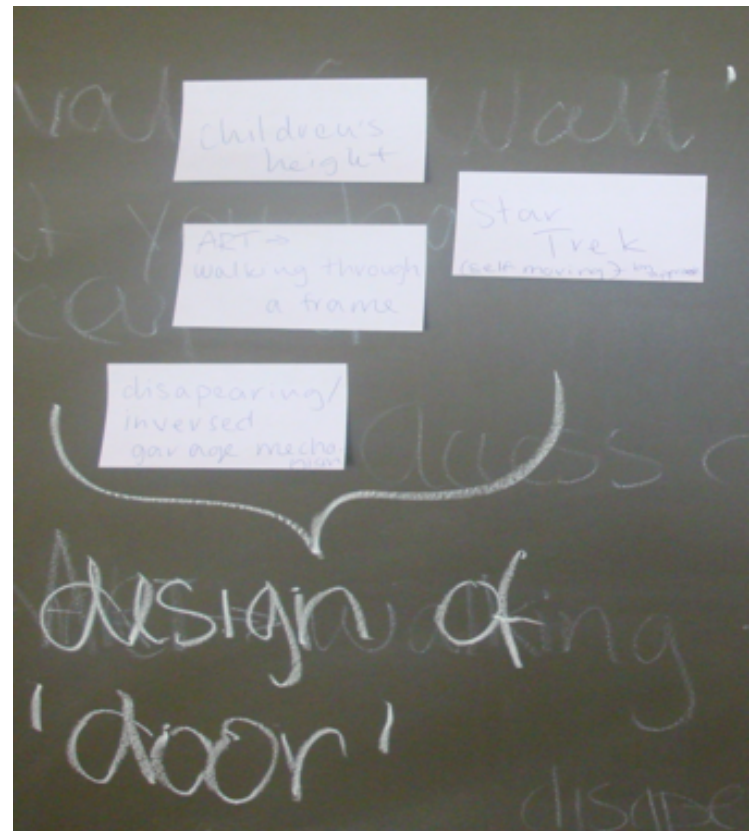
The test subjects decided to sit together and work as an entire group instead of creating each their door. The output can be viewed in the illustration below.

FIGURE 6: OUTCOME FROM THE CO-CREATION TEAM

FIGURE 7: METHODS OF OPENING A DOOR



FIGURE 8: DESIGN OF DOOR



A very interesting part of the output of the co-creation team was that they felt a need to systemise their ideas for 'the door of their dreams'. In order to be able to come up with the proper ideas, they wrote down a number of subjects that they all agreed were necessary for their dream door, which they then brainstormed for prior to constructing the door.

The subjects were: 'Methods of opening the door', 'design of door', 'material/new access', and 'functions to make me happy', all of which can be viewed in the figures above.

FIGURE 9: MATERIAL/NEW ACCESS

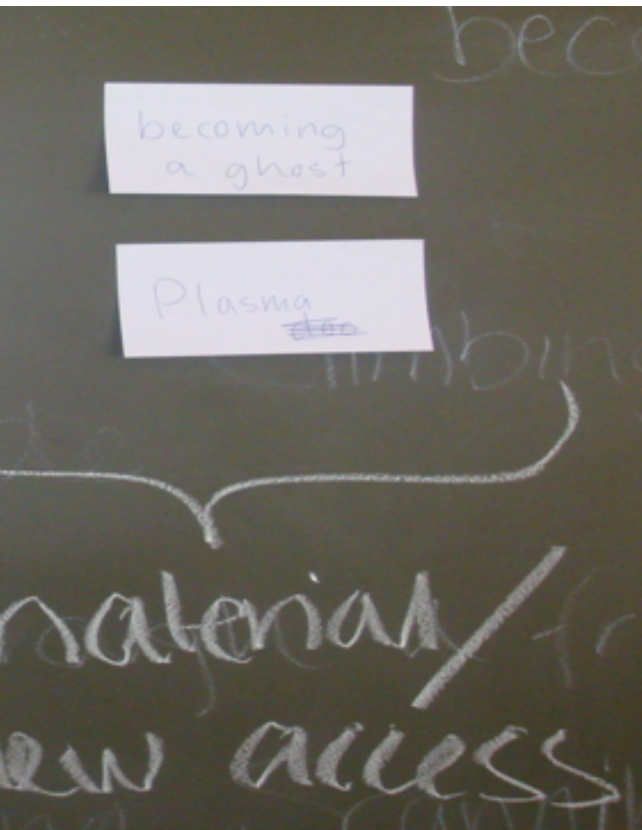
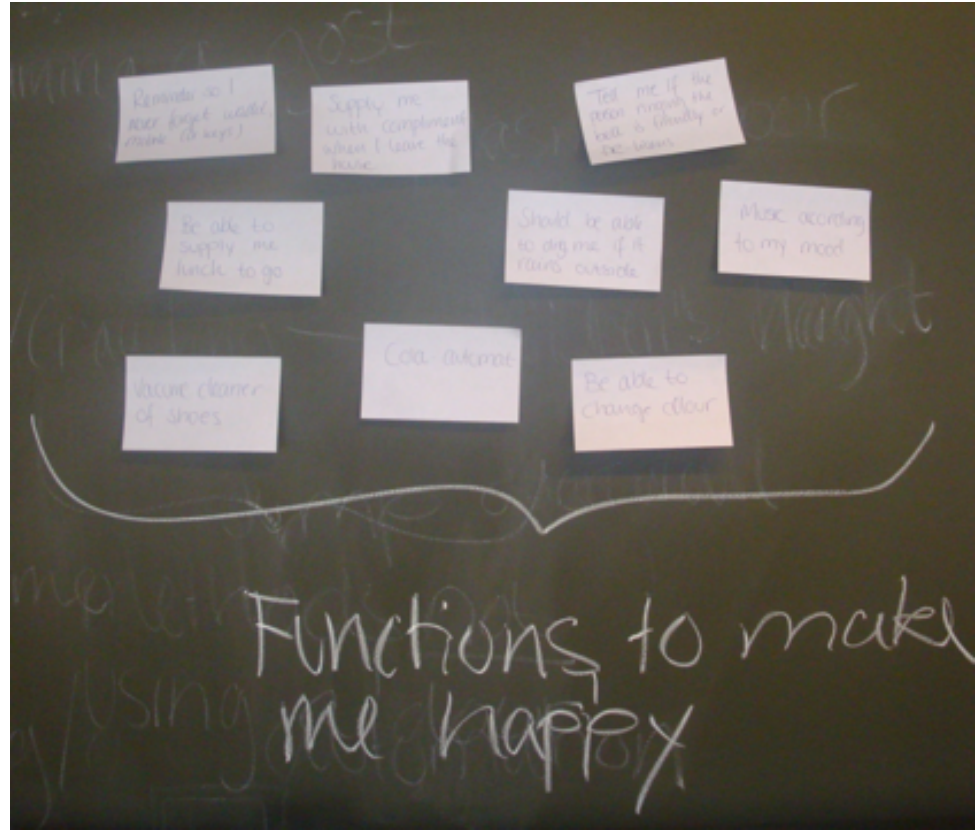


FIGURE 10: FUNCTIONS TO MAKE ME HAPPY



The test subjects found the method to be very exciting, fun, and easy to use. They really felt that their ideas were listened to and put through. They realised that not all of their ideas would be realised, but they appreciated the fact that they were even asked. The method can be used by all people in all ages, and not much time needs to be set aside. Also, the method can easily be documented and, thus, used throughout different departments and even companies.

However, they also mentioned that this method seems most useful for product-based developments, so it is limited in using for e.g. new business setups or process development. If so, the method itself needs to be further developed.

Another aspect that they mentioned is that it can become difficult for researchers and companies to screen out what is a 'must/need to have' and a 'nice to have'. People can tend to get very imaginative at times, and it can be difficult to sort out what is in fact useful information and what is simply a good idea. Also, the researchers and companies must be careful with not 'promising' different possibilities and set up expectations that can perhaps not be met.

Lastly, the test subjects mentioned that the method could quickly become highly unstructured and useless with no configuration of direction. However, the test subjects quickly overcame that challenge by simply coupling the method of co-creation with the method of brainstorming.

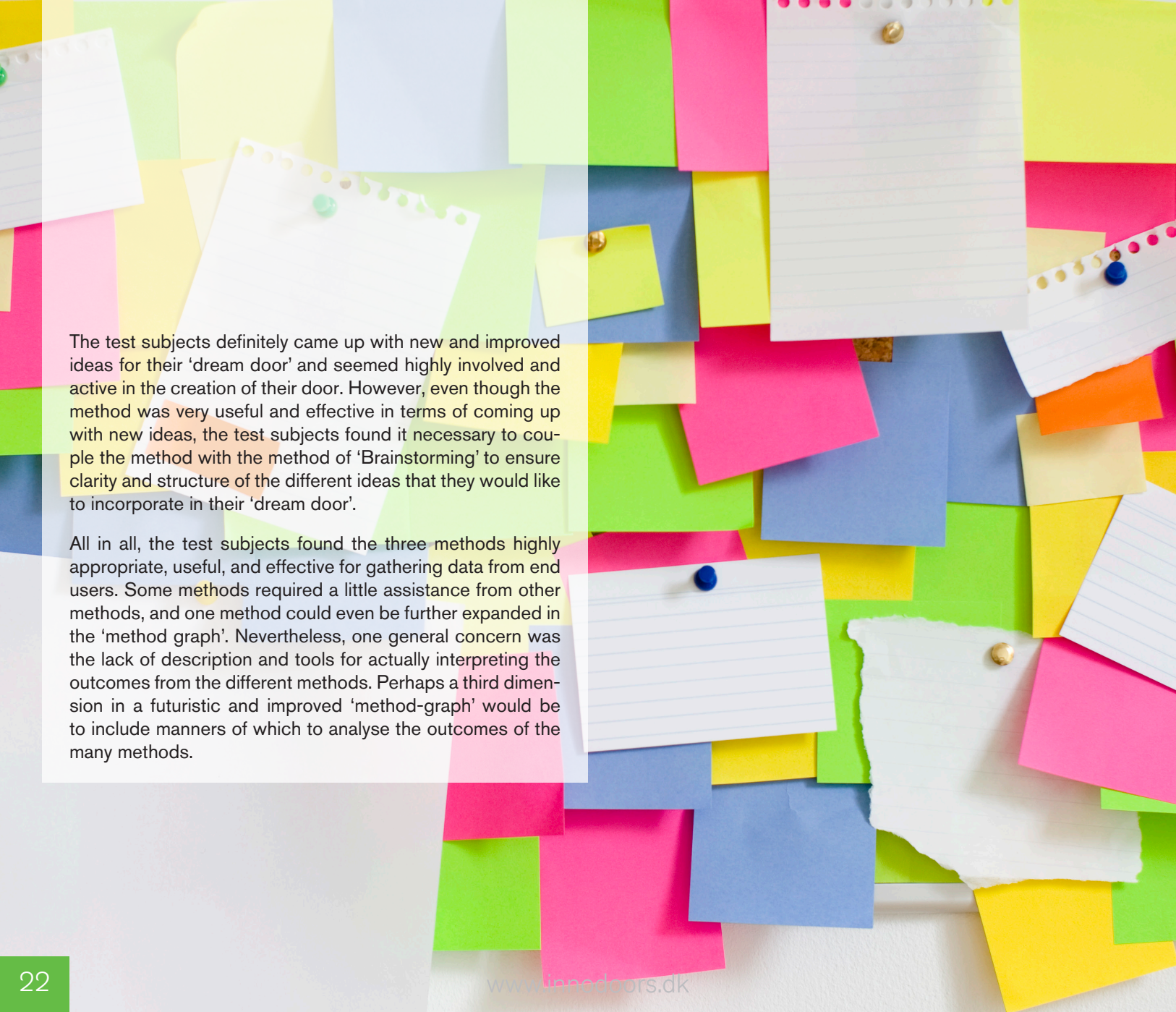
# Conclusion

The purpose of this publication was to test a number of methods first mentioned in the 'method-graph' presented by Project InnoDoors. The purpose of the test was to determine if in fact the different methods involved the different levels of 'user roles' and 'user activity', based on Merit and Nielsen's (2006) research on user-driven innovation were accurate in the 'method-graph', usable, and effective for user-driven innovation.

The method of 'Observation' was set in the 'method-graph' of being placed in the 'passive observation/active participation' and 'non-participating/informing'. According to the test-subjects and their experience with using and assessing the method, the classification and description of the method fit the actual outcomes from the method. The users can go no further than informing the people observing them within the area that is being observed. However, as suggested by the test-subjects, coupling the observation method with questioning and short interviews of the end-users can heighten the method's usefulness and the potential outcomes.

The method of 'Photo diary' was classified as 'user-controlled development' and 'non-participating'. However, the element of calling this method 'non-participating' for the end-users could be more nuanced. The pictures taken by the test-subjects were of more informative than expected and perhaps even evaluating of nature. The test-subjects took a stand as to the function of the different doors and not only displayed the usefulness of the doors in their current situation, but come up with other ways of using and perhaps improving the doors during the plenum discussion in the end of the test session. As such, the method of 'photo diary' should be enhanced in the method graph and span all the way up to improving and evaluating role for the users. The users will have the opportunity of taking pictures of whatever they attach importance to (both good and bad), which can serve as input for the product and concept development of a given product.

The last method of 'Co-creation' lived up to its classification of 'active participation/user-controlled development' and 'improving/developing'.



The test subjects definitely came up with new and improved ideas for their 'dream door' and seemed highly involved and active in the creation of their door. However, even though the method was very useful and effective in terms of coming up with new ideas, the test subjects found it necessary to couple the method with the method of 'Brainstorming' to ensure clarity and structure of the different ideas that they would like to incorporate in their 'dream door'.

All in all, the test subjects found the three methods highly appropriate, useful, and effective for gathering data from end users. Some methods required a little assistance from other methods, and one method could even be further expanded in the 'method graph'. Nevertheless, one general concern was the lack of description and tools for actually interpreting the outcomes from the different methods. Perhaps a third dimension in a futuristic and improved 'method-graph' would be to include manners of which to analyse the outcomes of the many methods.

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