Note:

1. The full implications of developing of the product category space can be best understood if the designer chooses to use it for his own project. It demands that the tool is set-up for his specific project. More about it later.

2. If you plan to use this tool for your design project, we recommend that you read the chapter so this topic to get background on the significance of the tool to product semantics and benefits that your project can get from its use.

To read more on categorization theory click on **[Chapter 5a]**

To read more on category map click on **[Chapter 5b]**

Why: The objectives of the tool

The tool maps how people perceive and structure the product category. The discreet objects that we see in the real world loose their individuality when they become part of the mental world. They are seen now as part of an abstract category, with its 'typical' example, which is used as a cognitive reference. All the other products are compared to this reference. Thus the discreet objects become part of a continuum, which has asymmetric structure. This tool is designed to externalize this structure as a map locating the products on a scale. For theory click **[Chapter 5a]**

The way the tool is conceived, designer would learn to use the mapping tool for the project he is currently working on. For general objectives shared by all the tools, use following link.

Overview of the tool

Accounting for the perceptions of number of respondents (number as defined by the designer. The tool allows people to group the products into five classes; namely
1] Very typical; 2] Typical; 3] Not-so-typical; 4] Atypical; 5] Very Atypical.

The interface is playful. The respondent drags and drops the images on the screen into one of the five compartments. These decisions are stored and played back to the respondent and s/he is asked to give comments and reasons for the classification. These comments can be audio recorded. The compilation and processing of this data offers interesting statistical conclusions and deeper insights into the perceptions of the respondents.

Typical results
The compiled data is converted it into a linear map [continuum] where the product considered as most typical by the respondents is located on the left edge and others are arranged on the right side on the scale on the basis of the scores computed by the software. The scale used is 1-10.

A sample map is a sequence of images as shown in figure below. The map shows images in sequence on a scale. It also displays the data of how various respondents have grouped each image i.e. average score of each image and standard deviation etc. Clicking on the image reveals the comments and reasons for the decisions by the respondents.

For sample map click here **[Product category map]**

How to set up the tool

Set up a new experiment

The opening screen shows "Semantic Tools: Mapping of Product Category".
To firm up your ideas and set up a new experiment needs more time to collect images. The buttons below take you through the steps required. But to do this in one shot is not easy. So, the system permits you to return to the incomplete experiment through edit modes. See later discussion.

This section will deal with the steps required to set up the tool for your project. It ends up with conducting a pilot experiment.

General precautions
Make sure that you edit the pictures so that these objects occupy substantial area of the frame. (Recommended 60 to 80 percent area of the cell). If necessary, you will also have to get rid of the noisy background that can mislead or give clues so that focus remains on the object.

Documenting experiment information: Step 1

Object name:
Insert name of the product/domain that you are working on. *This is required so that you are able find out what projects you worked on anytime later.* It could be say …. Camera, Necklace, Cartoon character; Apartment building etc.

Experiment name:
Use a catchy name that you will recollect later. The name will be used to access the data later. Or When you send the access on internet to the respondent, he will see this name.

Experiment description:
The description should be concise as it will be available to the respondent on the opening screen. It should attract him to participate. Maximum length of the description to be 30 to 35 words.

Category variables:
It has default titles for category mapping tool such as Very Typical, Typical etc.
You may want to use another language or titles that might be easy for the respondent to understand. This provision will be added in future. At the moment this is difficult to implement.

Customize respondent form: Step 2

Decide on the respondent data [variables] that will be useful for the project. Some of this information is standard and is anyway included in the form, such as 1] Name; 2] gender; 3] Occupation 4] Contact number 5] Designer/non-designer.

The form can be reconfigured to include different variables. Up to four variables defined by the designer can be used. Based on his requirements and access to the respondents, he can reconfigure the form.

These variables include,

1] Age groups:

Totally five options are possible. The facility allows you finer distinctions when working on projects for children or elderly where the age range can be different and sometimes narrow.

2] Education:

Allows you to fine tune options, particularly working with low literacy level respondents.

3] Income group:

Allows you to fine tune options, particularly working with low income or very high income level respondents.

4] Region of residence:

Collecting photographs as samples: Step 3

Designer/researcher must collect photographs of objects/products from the given category. Try to collect photographs of competing products in the local as well as international market. Make sure that your selection includes those that are commonly available as well as some that are uncommon and are considered somewhat adventurous variation. These photographs will be used as samples in the experiment.

Digital photos permits removing the noisy background, which often reveals contextual information that may interfere with the user's judgment. Uploading of square frames is easier; if not, make sure that at least two opposite sides of the photograph touch the boundaries of the square picture.

Desirable frame size 200x200 pixels

Setting up image pack: Step 4

The software is designed to permit up to 30 images to be included. However you can use minimum 15 and then any multiple of 3 up to 30. Some of the product categories are crowded with large number of competing products. When the number of images increase, the respondents tend to be casual and the results may not be reliable. In such cases, it is necessary to repeat the experiment with another set of 15 images with respondent having similar profiles.

When you need 15/18 images, it is preferable to collect about 25/30 examples and then edit out those that are either too ambiguous or have dramatic angle or lighting, or are simply bad copies. Digital copies are preferred from the point of editing and later uploading them, else scan the prints to create digital copies. It is not uncommon that after the pilot, you need to change few images.

The detailed instructions on uploading of images and preparing the experiment are given on relevant screens. If you want to change the images after feedback from the pilot experiment, you can go into edit mode to do this.

Note that for every respondent, the images remain identical, but their sequence is changed internally to ensure that results do not show influence of the sequence on the top images.

Selecting the respondent and the logistics

When the design assignment is finalized, clients as well as designers have a fairly clear idea of the user group that will buy and use the intended product. Selecting the respondent carefully is critical. You must make sure that you have sufficient number of respondents in each age group/gender/income group. (Normally, recruiting agencies can be told to ensure this.)

The way experiment is designed it is not necessary for the design researcher to go to the respondents. This data can be collected by another agency or by volunteer surveyors. It is also a web tool and the respondent can work when s/he is free and submit the data. However, as coordinator, you have to follow up the development on telephone.

Note that for the analysis that follows, design researcher has to be involved. Similarly, his personal involvement is critical for setting up the experiment and in pilot studies.

Pilot test experiment

Before committing to a major experiment, it is a good idea to pilot test it. Many times some editing of images etc. may be necessary. Clicking on the button creates experiment where five respondents can participate. It is desirable to implement this in your presence, so that if there are ambiguities in understanding, you may have to go to edit experiment and correct it.

Send experiment

Following options are possible

1] You have the option of conducting the experiment yourself where you approach the respondents individually (this is possible for students)
or

2] Get volunteers to do this for you (Normally corporates would prefer it)

In either of the above cases, you can fill your email ID in the table as many times as the number of respondents you want and then go to each respondents.

3] Many times it is not possible for a volunteer surveyor to go to every respondent. You can send the experiment by email to the respondents on the email list that you had prepared. Fill up their IDs in the table and follow it up on telephone. When they complete the task, the results will be automatically uploaded.

Edit experiment:

Edit experiment info

In fact, editing the uploaded information is not uncommon even after you do a pilot. There is always a possibility that you may have to add or replace information that was uploaded before.

The screen shows all the experiments that you may have done or planned before, just in case you want to revisit them. It allows you to edit the information on specific experiment that you may have used earlier.

Edit experiment images

Allows you to change the images that you may have uploaded earlier for a specific experiment. The process is 1) To select the image that you want to substitute. It will act like a place holder. 2) Upload the new image .

Result analysis

Once the required number of respondents complete their task, clicking on this button gives you the following.

A. The web tool computes frequencies to decide the typicality scores. The results convert the perceptions of the respondents into pictorial linear product category map/s. These maps capture how people have perceived various products and locate them on graded scale, starting from the typical to atypical.

B. The tool can generate separate maps for the different classes of respondents. The method allows you to compare responses of groups of respondents. (age, gender, income, region etc.) It depends on how you have configured the data sheet for collecting the respondent information.

   When the sample size [number of respondents] is large, it can define the shared product category perceptions of different groups and convert them into separate maps. It also considers designer as a separate group and permits understanding their perceptions.

   If you take the mouse on these images, pop up box gives basic image based information such as its score on the scale and standard deviation. Besides, image wise information on dwell time and change of mind data is also presented. (See later discussion)

   Besides this, if the respondent's comments are available individually as recording of voices. In case the experimenter/volunteer has transcribed these comments, they will be available as text.

C. The software also sequences image wise statistical information

For details of the interpretation of the data
Takes you to the chapter 5a
To see how people perceived different design variations in camera click on

[Example]
Camera and pendent example

Individual image based analysis

Dwell time & change of mind

The system sequences all the images based on Dwell time data, with images taking shorter average time on the left edge and then incrementing to higher dwell time. (See display sequencing at the end) It also incorporates change of mind data, but does not use it in computation.

The images give information of the

a. **Average:** Average time taken by the respondents to classify all the images into any of the five classes. This value is provided for comparison. (Explanation. Summation of time taken for all images by all respondents and divided by number of images.)
b. **Image based average:** Average time taken by all the respondents to classify the specific image into any of the five classes. [Explanation: Summation of time taken by each respondent to classify image X, divided by the number of respondents. Also lists SD]

Display b/a as a factor. It could then sequence the images based on the number arrived at. Lower numbers will come up first.

c. Average time taken by the respondents to group each image into the one of the five classes. Number of times the class is selected is most important. Shorter time shows the confidence of the respondent. So, what is displayed is the number of time that image was classified into each of the five classes; and the average time taken to take decisions for each of the five classes. It is displayed as three figures. [First: Which class 1-5;] [Second: Number of respondents who classified it in that class]; [Third: average time taken for the classifying in that class]. (Explanation: Theoretically, each image can be classified into any of the five classes. However, the chances of it being classified into class X and perhaps class Y are high and for others, chances are lower)

Images that show longer decision time are assumed to pose a problem in taking the decision. Obviously they need special attention during analysis. The time taken for decision should be treated only as additional information.

In any case, this information cannot be fully relied on. The delay could be due to external interruptions like a visitor dropping in or a phone call. There is some effort to separating such events. The tool neglect the data of the respondent for that image, if the time for that particular image is five times more than the average time that he has taken for preceding and succeeding images.

Change of mind

In the drag and drop display, it is not uncommon for the respondents to later change their initial classification. It often happens to only few of the images. Computing the number of times the classification of the image was changed captures these uncertainties. In the image based data discussed earlier, this number is added. In a way this data represents difficulties faced by the respondents in classification and can be correlated with average time taken.

Final display will be as follows

[Show images in sequence arranged on b/a starting with shortest first]

[Ave. Dwell time b/a] [Change of mind no.] [Typicality score & SD]

Note that change of mind is '0' if it is dropped in a single shot.

These figures do give some insights into the nature of the product form and are worth looking into. We believe that most typical products will have low average classification time and almost no change of mind. It is likely to be opposite, but not linearly, for products as you go away from the typical. It may become possible to differentiate between the two close products on the gradient because of this data.

Practice project

Since the idea as well as the interaction is new to the respondents, they should go through a short practice tasks similar to the final experiment. Offer the trial experiment first. It takes care of difficulties in understanding what he is expected to do, removes initial inhibitions in giving decisions and makes him familiar with the interface. Besides, in case he is stuck, the experimenter can explain or help him and ensure that he is encouraged to respond. We have included three practice sessions to ensure that the product category is different. It will not influence the results of the final experiment.

Do not insist on using the comment section in the second part in the pilot that the respondent is expected to use. Knowing that he has to give explanation for his decisions in the final experiment will make his decisions less intuitive.