

Figure 4c: Example of Usability Visual Panel and questions to stimulate the team.



In the first stage the ideas are generated through brainstorming stimulated by content of semantics and symbolism. In the sequence, the ideas are evaluated through a multicriteria matrix. The ideas selected in the first stage are used to be improved or stimulate new ideas in the second stage. In the second stage the Gestalt principles are presented to the team to stimulate the next brainstorming. In the third stage, after the presentation of usability content, the ideas selected in second stage are improved through brainstorming stimulated by usability content and then are selected the best ideas to be, finally, evaluated in the last phase.

In the phase of **final evaluation**, the ideas are confronted against needs and requirements defined for the market segment. The result is a report describing each new product ideas to be used to include in product planning through technology roadmap.

## APPLICATION OF THE SYSTEMATIC – CASE 1

The application of the systematic was performed in a case study [10]. This procedure allows a broad and detailed knowledge of the object of study and can be interpreted as a pilot study to other cases [11]. Eight people formed the planning team: five mechanical engineers, one mechanical designer and two product

designers. All participants already had some experience with product development. The technology roadmap that was used for the definition of planning problem [12] is partially represented in figure 5.

Information about market considers the planning problem of a new washing machine to two new market segments: ECO and PREMIUM.

## Results of Problem Preparation Phase

The phase of problem preparation is constituted of two activities: define the problem and horizon of planning; and identify the needs and segments of market. These activities are performed based on information of the roadmap.

The team should analyze information and summarize the results of phase.

For a simple map and a relatively well known problem, these activities are not difficult to perform and it is important to uniformize information between team members. In the present case, the results were: planning a new generation of washing machines; horizon of planning: 3 years; needs: have good performance, be durable, be agile, be economical, smaller size, be silent, be sustainable, be comfortable and have water reuse systems; and market segments: ECO (appreciate performance and economy) and PREMIUM (appreciate comfort, agility and exterior design).