Design for Future Needs
Case study of Project F: fabric care futures

Creating Imaginable Futures:
Using Design Strategy as a Foresight Tool

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Design predicts the future when it anticipates experience...
—**Augusto Morello**

Governments, corporations and institutions all need to plan for the future, but the difficulty of planning complex projects with long-term effects is well known. Decision makers need all the strategic foresight tools available to help imagine possible futures more fully and evaluate them more completely. Data generation, risk/opportunity assessment and scenario-building may not be enough. Design offers techniques for enhancing future scenarios with the visual, the spatial and the experiential. Design research methods can enhance the process of getting richer feedback from audiences. In addition, strategic design can be used to get deeper levels of understanding and buy-in from various stakeholders. All these activities can greatly augment and improve the quality of foresight and planning.

This case study of Whirlpool Europe's recent foresight projects shows how a corporation has used design as part of a multidisciplinary effort to shape its business policy for the next ten years. We highlight the approaches Whirlpool Europe used and outline how they could become useful tools not only for those setting strategy in corporations, but also for policy-makers.

Design methods (particularly strategic design, visualisation, prototyping, user experience assessment and feedback) can elicit tacit information that is invaluable to planning and yet difficult to gather any other way. Although these methods cannot predict the future, they can be used to gather better information about it.

Our paper explores how design helps to create an **imaginable future**—one leading to a richer response from customers and citizens, and to more relevant information for decision-makers. Visualisation methods ranging from sketches and renderings to computer modelling can help make ideas seem real in earlier stages of planning. Convincing physical prototypes can embody ideas for products, environments and systems. Scenarios of use (through storyboards, videos or demonstrations) can model ideas into seemingly real situations so that audiences have much more to respond to, prodding them into a fuller reaction. By giving more information through designed models and materials, and eliciting more in return, planners

can gather information, gain insights and affect the direction of projects much earlier in the process.

The case study focuses on *Project F: fabric care futures*, an advanced design research initiative by the Global Consumer Design (GCD) group of Whirlpool Europe (Cassinetta, Italy), led by design manager Richard Eisermann. This project explored what the future of fabric care could be in the next ten years and how this might affect the manufacturing of major domestic appliances.

Whirlpool used a combination of broad-based traditional market research, trends analysis and qualitative research to inform their strategic design process. Qualitative design research doesn't simply ask what consumers want; rather, it observes their preferences and actual usage. It employs techniques from anthropology and ethnography to gain insight about the actual behaviour of people. For *Project F*, the Whirlpool Europe Usability laboratory organised a qualitative in-home study in three EU countries, observing people during their typical laundry activities, to better understand their needs within the whole laundry process. This approach also allowed them to rethink the design of clothing care in general, not just people's interaction with washing machines. An external consultancy, FutureConceptLab, Milan, conducted a parallel quantitative research study about the concept of domesticity in six European countries. Using a variety of techniques to reveal various facets of the user experience, the company reframed the entire problem of what to design in the future.

Four design teams (three external and one from Whirlpool) imagined and developed concept products, in order to provoke ideas, dialogue and future decision-making about what type of innovations to the laundry process would best fit customers' needs and preferences in future years.

These were shown at key design exhibits and trade events in Europe (such as HomeTech, Berlin; Salone del Mobile, Milan), which generated extensive press coverage for Whirlpool and enhanced the company's reputation for innovation. The company will bring the prototypes back to the usability studio in 2003 to evaluate consumer preferences and inform the strategic planning for the Whirlpool 2004–05 product line.

By creating an innovation-friendly climate within the company, both *Project F* and the earlier *Macrowave* project (envisioning how microwave technology could be used in products quite unlike those we see on the market now) created an even greater impact inside Whirlpool than without. The quality of the project ideas stimulated internal interest, buy-in and support, and

opened up a dialogue between all the stakeholders involved: designers, marketers, engineers and executive decision-makers. GCD gained a great deal of credibility from the projects, so much so that divisions within Whirlpool Europe now vie for its strategic foresight services. By demonstrating its ideas through tangible means and gaining outside recognition, GCD gained a voice in discussions about corporate strategy and contributed an entirely new perspective.

Design research cannot be effective unless its results are communicated and acted upon. GCD Whirlpool Europe partnered with the company's communications department to position 'design research as a cornerstone of exciting corporate communication opportunities'. The company is committed to a follow-up project in 2003, demonstrating its desire to continue innovation in the field of design. In focusing first on products (microwaves), then on processes (like fabric care), next on products and processes in context (people's homes), Whirlpool Europe is positioning itself beyond the approach of the traditional appliance market. In creating imaginable futures, GCD is using the power of experience as a catalyst to shape visions of the company's future.

How can the process of creating an imaginable future be enhanced and extended?
There are several ways: scenarios could be displayed alongside the prototypes to show more vividly how they can be used. Involving users in the design process (participatory design) could give the company more feedback, particularly if it employed user experience assessments at the various stages of the process, and could help translate design research into realisable solutions earlier in the design process. Finally, integrating GCD's usability team into the evaluation of proposed user experiences could establish a feedback loop from imaginable futures into strategies the company could act upon.

The more important question, of course, is *how can such foresight activities be useful to decision-makers and policy-makers in other situations and organisations?* The Whirlpool Europe case study points to methodologies from the design professions that can augment the range of strategic foresight tools already available to policy-makers. We believe these design methods and activities offer a qualitative enhancement to current ways of planning for the future.

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Creating Imaginable Futures:
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> *Design is the conception and planning of the artificial, that broad domain of human made products which includes: material objects, visual and verbal communications, organised activities and services, and complex systems and environments for living, working, playing and learning.*
>
> **—Victor Margolin & Richard Buchanan** (1995)

> *Design predicts the future when it anticipates experience…*
>
> **—Augusto Morello** (2000)

Introduction: How is design relevant to planning for the future?

Governments, corporations and institutions all need to plan for the future, but the difficulty of planning complex projects with long-term effects is well known. The further into the future we want to look, the harder it becomes. Decision-makers need all the strategic foresight tools available to help imagine possible futures more fully and evaluate them more completely. Data generation, risk/opportunity assessment and scenario building are all helpful, but they may not be enough. Even involving stakeholders may have only limited value if the responses they give are not gathered well. Complementary methods from the design fields could augment these activities and make them even more effective.

In the past, information about how corporations used design was usually limited to inspiring stories about design's role in creating better products. Policy-makers and the public generally thought of design as a creative work that companies use to make products and communications desirable, marketable and differentiated as brands. Even within corporations, many people still view design simply as 'packaging' (putting an attractive skin on something), not as making a deeper contribution.

Over the last two decades, however, design has proven to be much more: a discipline that offers a range of processes for dealing with complex subjects. Design research methods can uncover rich information about people's behaviours and cultural patterns. As a synthesising discipline, design can help planners spot and map opportunities. Design offers techniques for depicting future

scenarios with the visual, the spatial and the experiential. In addition, strategic design can be used to get deeper levels of understanding and buy-in from various stakeholders. All these activities can greatly augment and improve the quality of foresight and planning.

This case study of Whirlpool Europe's recent foresight projects shows how a corporation has used strategic design as part of a multidisciplinary effort to shape its business policy for the next ten years. We highlight the approaches Whirlpool Europe used and outline how they could become useful tools not only for those setting strategy in corporations, but also for decision-makers in many different situations.

Design methods (particularly strategic design, visualisation, prototyping, user experience assessment and feedback) can elicit tacit information that is invaluable to planning and yet difficult to gather any other way. Although these methods cannot predict the future, they can be used to gather better information about it.

Our paper explores how design helps to create an imaginable future—one leading to a richer response from customers and citizens, and to more relevant information for decision-makers. Designers can build scenarios to embody and preview future possibilities that go beyond verbal descriptions or quantitative data. These design embodiments can then be used to elicit responses from different groups of stakeholders to inform decision-making. Foresight activities are not a closed activity or an action unto itself; they are a way of stimulating processes and dialogue.

Project F: a research project and design experiment

This case study focuses on *Project F: fabric care futures*, an advanced design research initiative by the Global Consumer Design (GCD) group of Whirlpool Europe (Cassinetta, Italy), led by design manager Richard Eisermann. *Project F* explored what the future of fabric care could be in the next ten years and how this might affect the manufacturing of major domestic appliances for Whirlpool, one of the leaders in that marketplace sector.

In the past, household appliances were viewed as functional, but not very emotionally laden. Any improvements to the appliances

were generally incremental: simply the next engineering feature added to the traditional white box appliance, with little awareness of changes of attitude on the part of consumers. *Project F* revealed a great deal of information about the complexity of current domestic life, and uncovered attitudes about consumers' images of self, home, family and friends, as well as design and product preferences. This information led not only to new products but also to a change in strategy and communication for the company.

GCD Whirlpool Europe is responsible for strategy development, design research and the design of home appliances for the European market. The group strives for design excellence in products and services they develop. They combine their design expertise with a strong focus on meeting the company's business objectives, and they also focus on people, with the goal of creating products that become central to people's lives. In order to respond to rapidly changing and increasingly sophisticated consumer needs and desires, Whirlpool uses a combination of broad-based traditional market research, trends analysis and, most importantly, local, in-home observation and interviews with householders who use the products.

Whirlpool's shift to user-centred design

Over the past few years, GCD Whirlpool Europe has changed its approach to foresight activities. It has shifted its emphasis from focusing on the design of products themselves to focusing more on the way consumers use them. In *Project F*, Whirlpool Europe employed a user-centred design approach[1]. Also known as human-centred design, this way of working is based on the premise that in order to create valuable and compelling solutions for particular groups of people (in this case, customers), designers must understand those people's needs and circumstances. This often necessitates research and also means that the research must usually be focused on the real contexts in which people use the product or service being designed.

This is the second such design research project for Whirlpool Europe. (Two years before *Project F*, the *Macrowave* project had invited designers to envision how microwave technology could be

[1] While some object to the term 'user', we have used it here because it is the most common term in the literature of human-centred design

used in products quite unlike those we see on the market today.) The company spent about nine months on the research, design development, and prototyping for one of these projects, and another year to communicate them.

Steps in a user-centred approach

1. Understand people/users (qualitative and quantitative research, observation of users, experience modelling)
2. Think outside the box (brainstorm, generate scenarios, think across disciplines, prototype quickly)
3. Design with users (participatory design)
4. Assess the user experience
5. Feed evaluation into another loop of design and further evaluation

Design research: quantitative and qualitative

Qualitative design research doesn't simply ask what consumers want; rather, it observes their preferences and actual usage. Most consumers, in fact, find it much easier to express their opinion about the perceived usefulness of a concept product when they can react to a tangible representation of it, not just to an abstract idea.

For *Project F*, the Whirlpool Usability Group organised both a qualitative in-home study in three EU countries (Italy, France and the United Kingdom) and a study using focus groups. (The Usability Group includes a cultural anthropologist, a usability specialist and 2 or 3 support staff.) In-home studies have the great advantage over focus-group studies that researchers not only hear how people present themselves doing tasks (how they think they perform it, their idealised mental model), but also observe people's actual patterns and routines in a real context. The researchers observed people during their typical laundry activities, to help the company better understand users' needs within the whole laundry process, and to possibly rethink the design of clothing care overall, not just customers' interaction with washing machines.

In addition, an external consultancy, FutureConceptLab (FCL), Milan, led by sociologist Francesco Morace, conducted a parallel quantitative survey about the concept of domesticity. Conducted with 2000 households in six European countries (Italy, Spain,

France, Germany, Poland and the UK), this research resulted in a study called *'New Domesticity'*[2].

The research methods used by designers are not unique to design. Quantitative research uses familiar survey and statistical methods. Qualitative research adapts a variety of techniques from the social sciences, particularly from anthropology and ethnography, to gain insight into the actual behaviour of the people being studied.

When designers use research, however, their goal is different: they want to synthesise the findings into possible responses, be they products, services or systems. Even quantitative design research can require a high degree of initiative and interpretation. Dr. Morace of FCL describes design research as 'a permanent proactive process'. To successfully read shifts in cultural trends, he says, one must go beyond the data by developing a more impressionistic understanding of each test group.

Eliciting tacit knowledge and latent needs

The Italian designer Augusto Morello distinguishes between analytic design, which is solving problems, and synthetic design, which is creating solutions in an ill-defined problem space. Designing for future needs is often the latter.

Frequently decision-makers do not have all the possible information about the conditions they are planning for. Often information is known to users, but not to planners. One of the goals of qualitative design research is to elicit this tacit knowledge and to reveal latent needs and desires.

Researchers use various field research methods as cultural 'probes' to elicit unarticulated needs. They use observation techniques to reveal behaviours too common or ingrained for users themselves to notice or report. Techniques used by the GCD Whirlpool researchers included:

- Video ethnography;
- 'Shadowing' of the subjects' activities and tasks;
- In-depth interviews with the subjects;
- Prompted visual self-documentation by users (with diaries, cameras, etc.).

[2] For a more extensive description of the 'New Domesticity' study, see Appendix 1.

Researchers gain many different vantage points on their subjects from these techniques. With the information they have learned, researchers then try to create useful models and frameworks that illuminate relevant aspects of user experience and behaviour. This technique is known as experience modelling.

Experience models are useful representations that show how people experience, understand and act upon the activities, environments, interactions, tools and objects that are critical dimensions of the client's business. Experience models provide the basis for strategic idea generation and opportunity mapping. Qualitative research methods and experience methods can be used by many different kinds of organisations and institutions, not just corporations; they can help in the planning of services as easily as that of products.

How does design synthesise solutions from research?

For *Project F* design manager Richard Eisermann invited three external design teams (two from Europe, one from the US) and the internal designers of GCD Whirlpool Europe to develop concept products in response to the research. The aim was to provoke ideas, dialogue and future decision-making about what type of innovations to the laundry process would best fit customers' needs and preferences in the future.

During a first workshop in summer 2001, designers were introduced to the user-focused research insights as well as to new technological developments in the field of fabric care. The research insights enabled designers to go beyond a short-term horizon and gain a deeper understanding about domestic behaviour related to washing and the diversity of such behaviour within the EU countries studied. These became a valuable source of ideas for the designers' brainstorming activities and creativity workshops helping them to keep in mind a representation of users' perspectives at their encounter with home technology. During the workshops, the designers used various visual techniques to envision the experience of users interacting with alternative systems for domestic laundry.

The designers mapped the research findings visually to show the relationships between concepts. They then sketched their ideas and discussed the various scenarios for projects, until they charted

five themes around which to develop the concept products. After the workshop, each design group went back to their own studio and worked separately from the others for about a month, gradually developing ideas and refining them through sketches and two-dimensional models. Two of the design teams created animations showing how people would use the imagined products and in what setting.

The act of designing is not simply a process of combining all the research information or blending all the possible solutions. Designers must use their own tacit knowledge and their experience of synthesising a solution from multiple sources and ideas. Innovation processes, whether in a company designing products or in many other endeavours, need to be rooted both in analytical skills and in more intuitive, synthetic ones. Designers are particularly well equipped for synthesising alternative solutions to meet human needs (Dykstra-Erickson et al., 2001).

The designers for *Project F* explored innovative technologies such as nanotechnologies and waterless washing for cleaning future types of fabrics, like those equipped with electronics. They also examined environmental and ecological concerns, especially about energy consumption and water conservation.

The internal GCD designers had easy access to their research and engineering colleagues at Whirlpool, and there was considerable informal discussion about the user research findings beyond the formal information given in the initial workshop. This interdisciplinary exchange informed the solutions, and suggests why it is best not to keep design teams too separate from implementation groups. (The converse is also true, however: it is best not to let implementation concerns prevent the imagination of future alternatives.)

In a follow-up workshop about a month later, each team used visualisation techniques, such as sketches, storyboards, animations and rough prototypes, to present their respective design proposals to the other teams. Together, they selected the strongest ideas to be refined in further iterations in the design process.

How do we translate research into design?

One problem that arose during the initial workshop was that the research results were almost too suggestive of possibilities, yet were not immediately meaningful or 'actionable' for the design teams. Even when the research material seems clear, the act of designing involves a considerably larger step than simply taking available data and repackaging them.

The difficulty of readily translating research insights into design solutions is common in foresight activities. One possible way to overcome this problem is to take advantage of the fact that design is an iterative process, in which designs are created and refined incrementally in each successive version. Going back and forth between the research problem and the design solution during each successive iteration allows for the true development of design concepts informed by research. Integrating researchers and other stakeholders in the evaluation of proposed design solutions can also be valuable.

Another possible way of helping to translate research into design is to have designers and engineers participate in field research and user experience assessment (usability) studies to gain knowledge on location.

To avoid losing sight of potential users and their context as a project progresses, designers often create profiles (also called 'personas') of prototypical users based on the research findings; these profiles can be used as a device to measure how well a particular design solution will serve the sample user. (How would this design solution fit into the life of User A?).

From design ideas to 3-D prototypes

Steps in using design as a foresight activity:

1. Synthesise ideas, technology and user behaviours
2. Create an understandable language (visual, visceral, verbal)
3. Model ideas (visualisation and prototyping)

In *Project F* the five concepts that were chosen to be further refined represented not only a range of innovative laundry systems, but also different points on the potential timeline of product development. A few of them could be realised with

current technology, but others were dependent on the development of future technology, like waterless washing or nanotechnologies.

The next step was to translate the five final concept products into refined three-dimensional prototypes, so finished that they appeared to be manufactured products.

Finished prototypes, of course, are not the only option for embodying design ideas. Visualisation methods ranging from sketches, drawings and renderings to computer modelling can help make ideas seem real in earlier stages of planning. Convincing physical prototypes can embody ideas for projects of many kinds: not only for products, but also for environments and systems. Scenarios of use (through storyboards, videos or demonstrations) can model ideas into seemingly real situations so that audiences have much more to respond to, prodding them into a fuller reaction: one that draws more information from them than they would be inclined to give without the provocation.

One could say that design helps to create an imaginable future—one leading to a richer response from customers and citizens, which in turn can lead to more relevant information for decision-makers. By intensifying the discourse—giving more information through designed models and materials, and eliciting more in return—planners can gather information earlier, gain insights earlier and affect the direction of projects earlier in the process.

Imaginable futures stimulate internal discussion

Design embodiments can elicit:

- Responses to help evaluate alternative concepts and scenarios;
- Feedback to assist in assessment of alternatives to inform decision-making;
- Information for thinking ahead.

In complex, real-world projects, foresight activities are aimed at producing orientations rather than predictions. To do so they need to be informed by different perspectives, people and disciplines, which present and assess alternative options for decision-makers to choose. According to Richard Eisermann, the main reason to do a research initiative such as *Project F* is not necessarily to put a

specific concept prototype into production, but rather to get feedback about which possible direction to pursue in the future.

An interesting side effect of the three-dimensional modelling and prototyping phase carried out at Whirlpool Europe was that it fostered informal communication between the designers and the company's engineers about technical feasibility of the concept products, something that was facilitated by the tangible and engaging properties of the prototypes. Design created a 'shared space' (Schrage, 2000) for a constructive act of probe-and-learn by which development teams gained a visual and tactile experience of what they might later develop into a product. In this way design and prototyping (of whatever kind) can help illuminate experimentation as well as implementation.

Although the *Project F* prototypes will not be directly translated into actual products, the idea of user-focus and social change, as well as the kind of technology embedded in each of them, can provide the company with interesting possibilities worth exploring for the next several years.

The possibilities of participatory design

Other approaches for capitalising on users' experience to support foresight thinking and decision-making could also be envisioned.

In an ideal foresight process, the initial design concepts would be developed in collaboration with users and then evaluated by them, so that their feedback would be incorporated into a second series of design proposals, which would be evaluated and modified. Prototypes would be produced, and then again evaluated and refined.

Participatory design methods encourage the direct involvement of users or consumers in the design process, increasing the potential for a cross-fertilisation not only among the different professions and competences that can contribute to a foresight activity, but also among the principal stakeholders that might be affected by the ideas and decisions there developed. These design projects can become symbolic processes able to engage people in constructing their own context and 'point to something meaningful' that they have constructed (Stacey et al., 2000).

In the case of *Project F*, the adoption of such an even more user-centric approach might have produced a more dynamic feedback loop, helping to develop and shape research questions, as well as design proposals, in a more flexible and representative way.

Participatory design may be more appropriate for public and non-profit project planning, with its need for a higher degree of external stakeholder involvement, than for a corporate product development enterprise. Wherever it is used, however, the important thing is to plan how to involve different stakeholders at different levels of the process.

The impulse to involve as many participants as possible in design research and planning should be tempered with the understanding that even small samples of people can provide a great deal of information. (The field of human computer interaction, for example, has shown that much can be learned from a test group of as few as a dozen people.)

Communication of the prototypes

Whirlpool Europe displayed the concept prototypes at some of the main design exhibits and trade events in Europe (such as HomeTech, Berlin; Salone del Mobile, Milan), and gained extensive press coverage from them, which enhanced the company's reputation for innovation and consumer-focused design.

Exhibiting concept products is not unusual, however. What makes this project noteworthy, in part, is that not only the products but also the research itself piqued the interest of the European press. The combination of the research from *Project F* and the *'New Domesticity'* study provided European media with a wealth of material that stimulated commentary and debate around design, consumer trends and societal behaviour. This helped Whirlpool to present and communicate the relevance and foresight value of the *Project F* concept prototypes to a general audience.

Part of the purpose of this project was to reach the decision-makers who specify Whirlpool products in domestic or institutional environments; another aim was to reach opinion makers and influencers. The press coverage of the project helped achieve those goals. The business, style and design press all covered *Project F* extensively, enhancing the image of Whirlpool Europe as

an innovative and design-oriented company. Before *Project F*, the company hadn't seen nearly this quantity of material published about Whirlpool, especially in magazines dealing with the 'leading edge' in technology, trends and style.

By now, Whirlpool Europe has collected positive (although anecdotal) user reactions and appreciation. One of the prototypes has attracted much more attention than the others. Designed by the GCD Whirlpool team, the concept called *BioLogic* uses a 'slow wash' approach based on cyclical, natural processes of regeneration. Instead of a single wash drum, the laundry is distributed to a number of washing pods in a low unit containing hydroponics plants, which, if feasible, would purify 'grey' water used in washing. Power for the unit would come from fuel cell technology, producing only water and heat as by-products. *BioLogic* would capture and retain these as part of its resource conservation approach.

Why are audiences drawn to this particular object over the others? Because of its sculptural form? Because it incorporates plants? The GCD team wants to understand the reason for the positive reactions to the project, to get a better sense of the level of acceptance for such a dramatically different solution.

Of course, examples like *BioLogic* are concepts. The realities of technical standards and environmental requirements are very exacting, and will change the concepts into something far different. More engineering simulations will make these projects more plausible and closer to product.

At the beginning of 2003, the company plans to bring the *Project F* prototypes back to the usability studio to make a rigorous evaluation of consumer preferences. Whirlpool will then decide which ideas to develop and implement. The findings are intended to inform the strategic planning for their product line in 2004–05.

Design embodiments stimulate internal discussion about strategy

The impact of the *Macrowave* project and *Project F* inside the company was perhaps more dramatic than their effect outside. Whirlpool's GCD initiated the *Macrowave* project on its own, in part to create an innovation-friendly climate within Whirlpool Europe. The quality of ideas embodied in the prototypes

stimulated internal interest, buy-in and support. It opened up a dialogue between all the stakeholders involved: design, marketing, engineering and executive decision-makers.

By demonstrating its ideas through tangible means and gaining much outside recognition, GCD earned a great deal of credibility from the project, so much so that divisions within Whirlpool Europe began to vie for its strategic foresight services. GCD gained a voice in discussions about corporate strategy. After the *Macrowave* project, insights from their concept prototyping bypassed the traditional development process and actually influenced the product planning for 2002, resulting in a new product, the microwave '*Maximo'*. The ability to demonstrate its ideas so clearly and tangibly gave Global Consumer Design a new position on the team of those devising strategy for Whirlpool.

Like governments and large institutions, corporations like Whirlpool need to gather considerable resources to do large projects; for this they need extensive buy-in from many stakeholders.

Not only did the project open up dialogue; according to Richard Eisermann, the project also helped create integration among different tiers within the company. It brought together design research, design practice, communication and, to a certain extent, engineering (horizontal integration); it gained credibility and trust for the GCD with key decision-makers within the company (vertical integration).

From design to implementation: a 'call to action'

The company is committed to a follow-up project in 2003, demonstrating its desire to continue innovation in the field of design. In focusing first on products (microwaves), then on processes (like fabric care), next on products and processes in context (people's homes), Whirlpool Europe is positioning itself beyond the approach of the traditional appliance market.

In pursuing its policy of strategic design and innovation, GCD is currently re-thinking and planning how to continue the design foresight activities like those in *Project F*—but more readily producible within strategic and tactical timeframes.

Whirlpool Europe is also aware that strategic design can become key to shape its future production by exploring how new configurations of products (or services) could best meet users' expectations in the years to come. This would be more important than looking at how new aesthetic forms may differentiate future products from those of the competition.

How could Whirlpool Europe have gained more from *Project F*?

To make its next foresight initiatives even more effective, Whirlpool Europe could add several elements to its process.

First, when prototypes are displayed for communication purposes they should be accompanied by scenarios showing their use, thus creating a more vivid context for the products being modelled. When the *Macrowave* prototypes were exhibited, Whirlpool showed them in small environments that were evocative. Unfortunately, the *Project F* prototypes were displayed as sculptural objects on pedestals. Despite a video loop accompanying them at the exhibitions, the overall impression was of beautiful but isolated formal objects. Ideally the company should have done more to contextualise them, so that audiences would have a greater ability to de-code the futuristic design solutions and make judgments based on more than simple likes and dislikes.

Second, strengthening the activity of designing with users (participatory design) could encourage people to be willing to provide valuable contributions throughout the various phases of the project. Participatory design methods have proved to be a powerful means for turning users into the broader role of committed actors within a project. Often this change of attitude and role becomes vital for reaching deeper into people's desires, needs and orientations that are projected very far in the future. The company's decision-makers, at the same time, could find design projects of this kind more reliable test beds for measuring the strength and general acceptance of each concept proposal.

Third, integrating GCD's usability team into the evaluation of proposed user experiences could establish a feedback loop from imaginable futures into strategies the company could act upon.

Design as a foresight tool

Finally, the main question to be answered is, of course, how foresight activities such as those being done by corporations like Whirlpool Europe can be useful to decision-makers and policy-makers in other situations and organisations.

Whirlpool used foresight-oriented design to:

- Create dialogue between internal stakeholders (design, marketing, engineering and executive decision-makers);
- Synthesise ideas about new technology and user behaviours;
- Visualise ideas (abstract complicated ideas and communicate them to the public);
- Create alternative models;
- Spark internal/external communication;
- Create openness to multiple alternatives;
- Affect strategic decision-making;
- Communicate internally and externally to get buy-in;
- Develop a vision of its own future.

Design offers the possibility for enhancing future scenarios with the visual, the spatial and the experiential. Design research methods can support the process of getting more meaningful information about people's thoughts, desires and behaviours. Design embodiments can invite a rich response from audiences. In addition, strategic design can be used to get buy-in and understanding from various stakeholders, thus becoming a living way of doing business and a dynamic cultural force. The design projects here presented played an important role not only in stimulating innovation but also in helping to rearrange and express the company's resources, competencies and activities more effectively.

Methods learned from the design professions—such as strategic design, visualisation, prototyping, user experience assessment and feedback—cannot predict the future. However, they can help reveal opportunities, motivate action and improve the basis on which to make decisions. The Whirlpool Europe case study points to design methods and activities that offer a qualitative enhancement to current ways of planning for the future.

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Appendix:

1. *Project F* and *New Domesticity*: Process Documentation
2. Glossary of Design Methods Relevant to Foresight Activities

Design for Future Needs

Glossary of Design Methods Relevant to Foresight Activities

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Actors	*See 'Users'*
Concept Models*	Diagrammatic representations of a solution's main categories and features that seek to reconcile business needs with user needs and technical capabilities.
Concept Testing*	Research with target users to evaluate the conceptual framework of a solution and generate refinements of that solution.
Context Research*	Review and gap analysis of existing user research, positioning the current experience within a relevant context.
Creativity Workshops	Fully immersive, day-long sessions dedicated to brainstorming aimed at stimulating innovative ideas for the design of products/services/systems. Often these activities are supported by sketching ideas (on post-its, boards, etc.) in collaboration among interdisciplinary workgroups.
Customers	*See 'Users'*
Diaries	*See 'Self-Observations'*
Design	*See 'Human-Centred Design', 'Participatory Design', 'Strategic Design'*
Ethnography	Type of social science research that investigates the practices and life of a community, by becoming one of its members. It is based on learning about a context and the people living in it, by understanding their values, needs and vocabulary. It usually requires long periods of time playing this role and a faithful report of what is experienced or observed avoiding any interpretation or evaluation as far as possible. Within the field of interaction design, ethnography or video ethnography are methods used to capture human behaviour in the context of the person's natural environment, as a means of gaining insights about user behaviour and unarticulated needs, in order to create innovative solutions. A more adequate terminology might be cultural, design or industrial ethnography.

Experience Modelling*	User research that describes the dimensions of a user experience, suggests how to support an existing user experience, and identifies how to transform and redefine this user experience. This may include observing users in context, observing what people say and do to support the creation of useful models and frameworks that illuminate relevant aspects of experience and behaviour.
Experience Models*	A useful conceptual representation of a user experience; used as the foundation for opportunity generation and solution design.
Focus Group	Representative samples of a target group, usually involved in qualitative-quantitative research, with the aim of understanding behaviours, needs and preferences of a specific population relative to innovative products, services and systems that are under development.
Human-Centred Design or User-Centred Design	Putting People First. Human-centred design is based on the simple premise that in order to create and deliver valuable and compelling solutions for people, businesses or governments, designers have to understand experience and apply that understanding to strategy and design. This approach guides the systematic and iterative development of desirable, usable, useful and sustainable solutions for governments, businesses and their constituents.
Laboratory Observations	Qualitative or experimental studies used to analyse cognitive and behavioural responses of people in specific (recreated) situations. Usability laboratories usually apply techniques such as simulations, video observations or observation through mirror walls.
Map	*See 'Opportunity Map'*
Market Research	Quantitative studies often based on the use of questionnaire/interview techniques to uncover social phenomena and trends on a larger scale, providing results at a statistical level.

Models	*See 'Concept Models', 'Experience Models', 'Task Models'*
Modelling	*See 'Experience Modelling'*
Observations	*See 'Laboratory Observations', 'Self-Observations'*
Opportunity Map*	An experience-based analysis of gaps in the current experience that reveal new business opportunities.
Participants	*See 'Users'*
Participatory Design	A term used to describe various activities through which users provide input, ideas and feedback to researchers and designers to help shape the concept and design of new products and services.
Participatory Design Activities	Participatory design activities include concept testing, collaborative prototyping, card sorting and scenario testing - that aim to foster the evolution of concepts and the development of prototypes.
People	*See 'Users'*
Primary Research	Actual, unmediated field research dedicated to understanding users within their environments (home; work place; public, retail or entertainment environs). Research techniques include interviews, video ethnography and self-documentation by users etc.
Process Flows*	Visualised representations of the interactions between the user and product or service functions in the design solution.
Research	*See 'Context Research', 'Market Research', 'Primary Research', 'Secondary Research'*
Prototype Testing* (low/medium fidelity)	Testing interim solution designs with users in order to evaluate the usefulness and usability of the design.

Prototyping

Development of 2D-3D physical objects implementing ideas about future products/services/systems that can help to understand their benefits, drawbacks or other issues related to their future use by consumers in the intended contexts. The observation of user interaction with behavioural prototypes allows the designer to gain insights on what works, what doesn't and why, at an early stage of the design process.

Scenario Building

A character-based story line describing the assumed practical context of use for a product or service. It helps to communicate the essence of the product/service idea within a defined and probable context of use. In focusing on the 'what if' question, scenario building helps to delineate desired or problematic outcomes.
See also 'User Scenarios'

Secondary Research

A review of published articles, papers and other relevant documents useful to develop an informed point of view on the state-of-the-art within an area and to identify trends in the field.

Self-observations/ Diaries

Method used when it is difficult or impossible to directly access a certain place (like people's homes) or access is too time consuming. It consists of asking people to provide self-observations about their activities in the form of log reports or diaries, for example. Although this method involves the subjectivity of the participants in the data collected, it can be valuable to get a glimpse of life through the eyes of the people that are being studied.

Strategic Design

Strategic design helps to manifest the company's vision/image/goal of a marketplace to come, the position/placement of its products and services in relation to other competitors, and its answer to anticipated user needs. Strategic design is based on and shapes mid- to long-term business strategy and goals. It concerns the whole product system, i.e. the integrated body of products, services and communication with which a company presents itself to the market and society, giving form to its strategy.

Task Models*	Description of how users think about and accomplish goals which serves as a foundation the concept, functionality and features of a product, service or website, etc..
Testing	*See 'Concept Testing', 'Prototype Testing', 'Usability Testing'*
Usability	Usability is the extent to which users can access the functionality of a system with effectiveness, efficiency and satisfaction to achieve specific goals.
Usability Testing* (medium/high fidelity)	Testing final or near-to-final designs with users in order to evaluate the usability (i.e. ease of use) of the solution.
User	A term chosen to refer to people involved during the design, evaluation or actual usage of new products, services or technological systems. Actors, customers, participants and people are other terms in common usage and reflect the design philosophy most relevant to the situation or process described.
User-Centred Design	*See 'Human-Centred Design'*
User Scenarios	Personalised, fictional stories with characters, events, products and environments; used to shape the design of concepts, test prototypes and validate the design of the solution.
User Segments*	Representations of user groups that provide the basis for a strategic design that will meet user and business needs.
Workshops	*See 'Creativity Workshops'*

Reference

* Armstrong M., Burrell M., et al, (2001). User-centered Design at Sapient. *Poster.* New York: Sapient publication.

Interaction Design Institute Ivrea

Interaction-Ivrea is a new centre for education and research in interaction design, based in Ivrea, Italy, with students and staff from 24 different countries. Its mission is to explore potential futures with interactive computer technology, and to develop new methods and insights into their design. The Institute has three arms: a masters programme, a laboratory for design research, and a knowledge-sharing initiative. Its founding sponsors, Telecom Italia and Olivetti, established Interaction-Ivrea to foster innovation and collaborations among designers, technologists, social scientists and business people.

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