

JOINING TRADITION AND INNOVATION IN DESIGN RESEARCH PROJECTS

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Abstract

Contemporary political, economic, social and technical developments have fundamentally altered the conditions for traditional industry and for design practice. While emerging technologies have brought problems and challenges, there are also new possibilities for renewal and innovation. In doing design research projects at the Interactive Institute, we have explored emerging issues in design practice, research and strategic questions at project and institutional levels, and the wider 'use' of design research in joining tradition and innovation. Two research projects and a design example are presented in relation to their organizational and methodological aspects and their wider significance in order to discuss connections made between strategic, research and design values.

Introduction

With a decline in the 'age of mechanization' [5] and the emergence of ambient intelligence and ubiquitous computing technologies (f.ex. [1]), principles that have permeated science and culture in the last centuries are superseded by a different set of factors. New technologies imply a dramatic shift in scale of the design act itself, beyond human scale to the basic and pervasive building blocks of the physical and digital world. Designers must learn to work with the complexities of such new materials and its intangible, temporal properties alongside mastery of the qualities and craft of traditional materials. Such a radical shift in scale and skills involved in design reflects and implies dramatic shifts in collaboration, organization and practice in the disciplines involved in imagining and creating the shape of the 'artificial world'.

As widely discussed in design studies, the old divisions in design practice are increasingly irrelevant in light of new technologies, management strategies, social forces and intellectual developments (f.ex. [6]). Evident in industry, for instance in the Doblin Group's innovation strategies such as Innovation Landscapes [2], design techniques and processes supercede traditional notions of form and styling and are incorporated into all aspects of innovation ranging from business models to product systems, services and customer experience. A recent report by ITPS, the Swedish Institute for Growth Policy Studies, quotes "Growth will be dependent on the interplay between the old and the new, within and between sectors and technology" [4, p 16]. Design and innovation, which are discussed as sharing critical expertise in moving from the 'existing' to the 'preferred', are thereby seen as parallel and complementary factors in both invention and renewal.

Reflecting concerns at the policy level, which must take into account a societal perspective across multiple sectors and the existing conditions as well as sustainable growth, the ITPS report states that the risks and long-term investment necessary for renewal through innovation and design are rarely taken in industry. Some alternative structures may be collaborative design research projects. For instance, a European research project called 'Project F' joined Whirlpool Europe, the Interaction Institute Ivrea, and three design consultancies using design as a foresight tool – experimental design methods and objects were explored for envisioning and directing future design strategy in the company and the sector [3]. Another example is an initiative between Hewlett Packard and the Appliance Design Studio, a virtual organization including the Royal

College of Art in London and IDEO, which employed speculative techniques inspired by critical design to evolve a series of new design concepts [7]. This paper discusses and reflects on projects undertaken at the Interactive Institute that I have taken part in, where an experimental design research approach was taken in relation to traditional and advanced technology sectors.

Design research in action

Two projects at the Interactive Institute, 'IT+Textiles' and 'Static!', and an example of a project outcome, the 'Energy Curtain', illustrate our approach, outcomes and wider implications for design research. Combining disciplines of practice and research, and joining together diverse collaborators and sectors, we discovered new synergies between tradition and innovation. Challenges that we faced in organizing, evaluating and growing quality are reflected upon more generally in relation to contemporary design and research issues.

Our approach

Technology as design material. A common research theme guides all projects in our studio, which acts as a foundation for growing new projects, integrating new team members and deepening research over time. Working with technology in artistic or design research requires rethinking since time, flow, energy and other dynamic elements become central in interaction with computational things. Exploring 'technology as design material' [8] alongside familiar materials that make up things, such as plastics, textiles and electricity, we explore how computation and its properties open new possibilities. Having some foundations in thinking and working this way, exemplified in previous work and publications, we approach each project based on its own characteristics, as well as our own set of questions applied to the new conditions, collaborators or relevant sectors.

Formats for collaboration. The Interactive Institute follows a quad-helix model, joining art, academia, industry and public sectors together in projects – explicitly operating from the outside and creating new intersections between sectors. Each studio, research project or strategic initiative, thus, becomes a meeting-place designed for inviting and facilitating participation among stakeholders. In addition to offices, our studio has a labs suited for instant pin-ups and spatial re-configuration and a separate room available for students from nearby arts and crafts, interaction design and technology curriculums to work on related thesis projects. Thus, the design of the space is intended to stimulate emerging working practices, encouraging overlaps, spontaneous conversations and new relations. Similarly, in other formats for collaboration, such as project structures, network initiatives, seminar series, or academic courses, we apply design thinking and methods to orchestrate the space, program, materials and discussion for creative synergies to emerge.

Experimental design research. We explicitly combine diverse disciplines and perspectives into projects, including competence in art, social sciences, engineering, philosophy and multiple design disciplines. Different work and research methods generate materials that populate and activate the physical space, encouraging new conjunctions and fueling brainstorming or discussions with stakeholders. Designing openings or 'slack' in project structures and the studio space, our intention is to support individual initiative, impromptu encounters and 'guerilla' projects. Some projects more than others may resemble a sort of controlled chaos, where an umbrella structure supports both typical user-centered project development but creates room and means for experimental interventions, fresh collaborations, or surprising outcomes. Working in

relation to established research methods and traditional disciplines, our intention is to mix them up and create space for reflection, evolution and the unexpected.

IT+Textiles

IT+Textiles [9] was a design research program carried out between 2001 and 2004 led by the Interactive Institute and Newmad Technologies in collaboration with the Interaction Design Group at Chalmers University, Ludvig Svensson AB and the Swedish School of Textiles at the University College of Borås. To create a larger platform for research and collaboration, it unites three projects funded through different branches at VINNOVA (the Swedish Agency for Innovation Systems). In relation to these projects, IT+Textiles was organized along two tracks: user-centered IT development, with explicit attention to the emotional and aesthetic aspects of inter-personal communication devices, and; development of textile materials in relation to advanced sensor and network technologies. The overall agenda was to apply user-centered and experimental design in investigating how pervasive communications systems might be present to people in meaningful ways through the things they live with everyday.

Formal and informal collaborators in the research program brought a diverse range of interests and competences, representing the traditional textile industry centered in the nearby Borås region, a diverse range of design and product companies, research and academic institutions, technology and service developers. Thus, desired outcomes ranged from product concepts and manufacturing techniques to academic publications and artistic exhibitions, from spin-off companies to new educational curricula. To incorporate all of these interests, the program was set up more as an open meeting place for collaboration than a narrow effort towards a single objective. Aiming to support experimentation and emerging synergies between diverse practices and expertise, IT+Textiles project work was structured around two formats: smaller projects or focused studies done by one to three people, often based on a particular material or disciplinary methodology, and; larger projects typically involving more than five people in developing a prototype or a concept based on combinations of findings from the smaller ones.

Through this project structure, approaches specific to particular disciplines as well as consensus-building or re-combinatory processes were exposed, resulting in a wide variety of concepts and methods, as well as emerging relationships and synergies among the team and collaborators. By combining multiple stakeholders, ranging from user groups to the multi-disciplinarity of our own team and diversity of collaboration partners, notions of 'use' and value were debated, not only in relation to different design concepts but different methods for practice and research. One outcome from collaborating with the Swedish School of Textiles, which started with joint project work, courses and a temporary satellite studio on their premises, grew into their initiative to revise their curriculum and an expanding research program together with Chalmers, where several researchers from IT+Textiles subsequently engaged as faculty members or PhD students. Working deeply in relation to traditional sectors but also pro-actively combining experimental methods and diverse formats for working facilitated reflection, discourse – and reform – in relation to various traditions and institutions.

Static!

Static! is a project at the Interactive Institute funded by the Swedish Energy Agency (Energimyndigheten or STEM) that began in 2004 and is in progress. Momentum behind the project has built up and evolved over time, beginning around the formation of a new Interactive

Institute studio focused on energy. Parallel to the establishment of strategic relations at the studio and institutional levels, our Institute's board supported a core group to begin research conversations with STEM and develop a structure and strategy for a project application. Because we were branching into a new sector where expectations and relations had yet to be established, this was significant since investing in multiple points of contacts was necessary to facilitate a 'mutual learning' experience and grow our agendas together at various levels. For us, it was critical that strategic discussions and research content could be approached together to maintain a coherent mandate internally and externally reflected in communications, processes and outcomes. A 'pre-start' phase within the core group consisted thus both of jump-starting some researchers into concept and theme exploration, and the strategic development and writing of the formal application to STEM.

A project was approved based on our proposal to investigate product and interaction design as a means of making energy use more visible and experiential in everyday domestic life. An intensive timeline posed a great challenge to deliver very many results extremely quickly – not only was it necessary to map out the entire range or breadth of the design space, but to identify the critical and deep research issues that would sustain research in the long term. Thus, we structured the project around two tracks pursued as parallel 'design loops', which were interspersed with convergence phases where the team would meet for internal discussions, collective work, or evaluations. Unlike IT+Textiles, project work in Static! was dispersed between three cities in Sweden, therefore trade-offs had to be made in terms of research culture in favor of rapid progress towards a number of quality results. In the first two loops, we ended up working with a slightly 'divide and conquer' approach, with a rather large number of people working in small groups in the project to generate and prototype a wide variety of design ideas. Halfway through the project, after a positive evaluation with external innovation and research experts, a more focused approach was taken with increased critical mass in the design team during the third design loop, and in the fall we begin user and contextual evaluations on multiple prototypes.

Both the strategic and research agenda for Static! have evolved continually in relation to STEM, within our Institute, and with external partners. To jump-start the project, we based certain design directions on existing work and collaboration partners in IT+Textiles, which was going on in parallel and provided both matched funding and a foundation for working in relation to established conditions. New partners from industry as well as regional and public authorities were invited into the project along the way, based, in part, on the types of product concepts generated. Given these circumstances – the distributed nature of the project, simultaneous strategic and research agendas, establishing cross-sectoral relations, and rapidly evolving and expanding interests in the project – developing shared understanding has been critical. In addition to applying experimental design methods, designing new collaboration formats have been essential. Our Energy+Design network, for example, was supported by the regional authority in order to better raise and publicize the discussion among industrial, public and academic stakeholders, and was a format for feeding design prototypes and research themes from Static! into the sessions to support arguments and provoke debate.

Example outcome: The Energy Curtain

As an example of the kinds of 'things' that come out of our design projects, the Energy Curtain is a prototype that developed in the overlap between IT+Textiles and Static! During the Static! 'pre-start', we lacked resources for research but we needed to start working with themes to fuel the

application-writing process and to get a preliminary team ready for jump-starting the project. To gather inspiration and insights into perceptions of energy, we did a rapid study using cultural probes among local families. Based on the competence and materials already in place for IT+Textiles and our findings from the probes, we developed the Energy Curtain.

Our concept involved product re-design, where control over a complete cycle of energy generation and use is put directly into the hands of users, integrated technically and aesthetically into a familiar object. A curtain was developed with two sides, one facing outside with solar cells and the other woven with fiberoptics, conductive, afterglow and reflective materials. Sunlight gathered during the day is stored and creates a subtle glowing pattern in the curtain during the night. Use of the curtain embodies an explicit trade-off between using and saving energy, since users play a tangible role in the energy and expression cycle through their choices to close or open the curtain. It also represents the notion of a completely self-sustaining object, extending on notions of ‘technology as design material’ in IT+Textiles to further explore energy and power as a material for building the aesthetics of a technical and textile object. Thus, the Energy Curtain developed ongoing research questions that were to be further developed as the Static! project launched, exemplifying both theoretical and practical potentials in our discussions with STEM.

Further iterative development of the Energy Curtain was a means for bringing in other types of expertise and collaboration into the project. Initially, textile and technical materials were donated to the project, providing openings for further involvement of various external expertise. The textile engineer began working with designers and technicians on site at Ludvig Svensson AB in order to integrate technology directly into materials in their current product line, thus discovering the potentials and limitations for manufacturing such hybrid textiles as part of her master’s thesis at the Swedish School of Textiles. Building such tightly integrated prototypes necessitated more specific technical knowledge and skills – discussions with the microelectronics institute Imego AB and a lighting company start-up produced not only improved prototypes but feasibility studies that could spin off into other research or development projects. The Energy Curtain illustrates how research methods, theoretical frames, design examples and collaboration formats were orchestrated in and across design research projects, ultimately spurring and exemplifying potentials for cross-sector collaboration and innovation.

Reflections on tradition and innovation in design research

Sustainable quality and research culture. In our work, achieving depth and quality of work – and growing it over the years – is critical. The Interactive Institute’s quad-helix model is set up explicitly to encourage risky, cross-sectoral and experimental research not undertaken within industry or universities. In fact, defining the kinds of research we do may often be described in the negative, as the ventures that stakeholders from multiple sectors say are important but which they themselves may not have the resources, long-term mandate or internal competence for doing. Nonetheless, it is an ongoing challenge to achieve quality not only in the amount and range of results but at a depth of quality that is competitive and relevant to established disciplines and sectors. As in other project-based organizations, additional instability with respect to operations, organization and economy also adds to the challenge of maintaining depth in results, diversity of competence and vital working culture. Long-term research themes, creative joint-ventures and formats for collaboration that validate outcomes on collectively negotiated terms may to some extent anchor both sustainability and growth. In any case, as larger socio-political changes likely impact cross-sector and experimental ventures more than established ones, continual re-invention in both operations and vision are essential to maintain relevance, integrity and quality.

Values and success criteria. While a (stereo)typical notion of success in design and innovation may be return on investment, in our projects academic, cultural, and societal value are also critical. Experimental design research and our mandate to specifically address art and the public has opened possibilities for alternative values and collaborations in different sectors. Increasing interest in research in prominent art and culture arenas is evident in exhibitions such as the Walker Art Center's 'Strangely Familiar', 'Konceptdesign' at the Nationalmuseum in Sweden, and Extra Ordinary at Stockholm's Kulturhuset, which include design research projects from the Interactive Institute (IT+Textiles and Static!), the Interaction Institute Ivrea, and the Royal College of Art in London alongside the work of renowned fine artists, architects and product designers. Such venues offer the opportunity – and obligation – for wider debate on the relevance and relations among art and design, research and innovation. Opening to such a debate provides alternative and well-established means of critique and an international forum necessary for lifting discussion above particular disciplines, projects and sectors in order to survey the field from a different perspective. Raising a discussion about success and quality criteria in such arenas is a means for establishing the value of alternative criteria for success, not only within project teams but also to clients or commissioners.

Based on our experience, ongoing self-reflection and renewal seem to be essential to design research in the contemporary situation. Our project structures and outcomes must not only relate to recognized quality criteria and traditional values, but should push the boundaries and raise the level of debate within industry, society and our own spheres of practice. While traditions and practice need risks and challenges to evolve, such experimental ventures also require support internally within working cultures and institutional organization and externally by stakeholders and society. Design research, and the growing community around it, has been an essential ground for combining tradition and innovation, not only in our own studio and projects, but in reflecting on the evolution and challenges of design and research in the future.

Acknowledgements

The projects presented here are deeply collaborative, and I gratefully acknowledge all my colleagues in IT+Textiles and Static! at the Interactive Institute, along with the Swedish Foundation for Strategic Research (SSF), VINNOVA, STEM and Västra Götalandregionen who have been primary funders for the work. Critical to initiating, conducting and reflecting on this work are: Johan Redström, the project leader of IT+Textiles and research director at our studio; Christina Öhman, Static! project leader; Sara Ilstedt Hjelm who was the Static! research leader prior to myself; Sara Backlund, project manager for the Energy+Design network, and; Staffan Truvé in all his many jobs. The Energy Curtain involves many members of both project teams, and it was Carolin Müller and Anders Ernevi who crafted the prototypes. My role in these projects has ranged from design researcher to project manager and research leader, since 2003 I have been director of the Interactive Institute's RE:FORM studio.

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