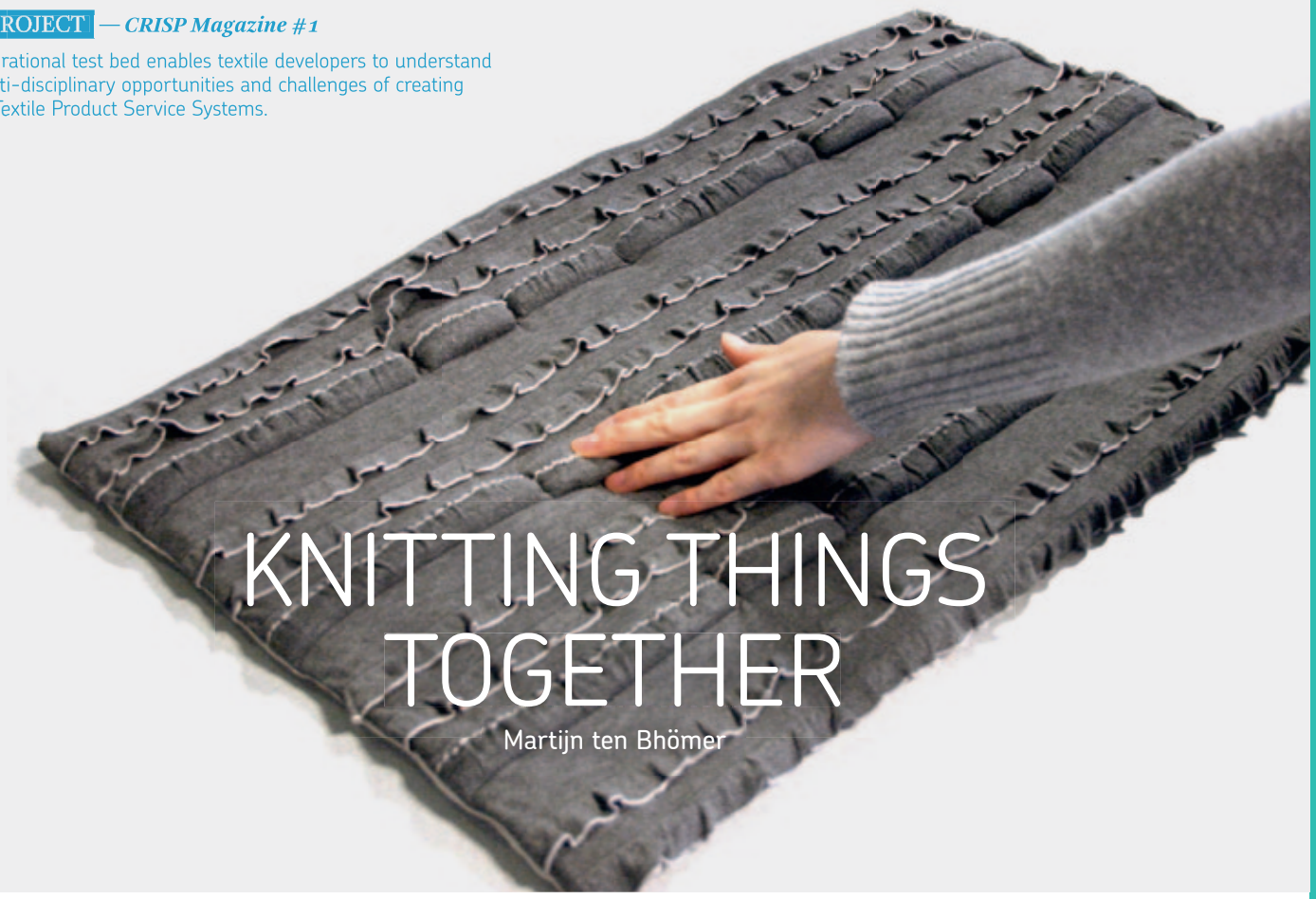
An inspirational test bed enables textile developers to understand the multi-disciplinary opportunities and challenges of creating Smart Textile Product Service Systems.



KNITTING THINGS TOGETHER

Martijn ten Bhömer

One major challenge in developing a PSS, is getting the production partners involved.

Martijn ten Bhömer's project for Smart Textile Services is a clear illustration of the designer's entrepreneurial approach. In it, he has teamed up with several local companies to develop a service that is designed, produced and distributed locally. Many of these companies are moving away from mass production towards smaller series and more innovative solutions. This also requires moving away from the vertical, hierarchical business style towards a more horizontal network of open innovation.

A 'normal' service design project often begins by making a clear blueprint of everything that the service in the end ought to have. With that blueprint, you start looking for partners who can deliver the individual parts of the service and try to draw them into your big plan. In this bottom-up approach, though, you start from the knowledge and facilities partners have and together examine how these can be combined in separate design directions. Unlike a pre-made blueprint that gets filled in during development, it is instead a process that you go through with the partners and something that develops over time.

Although there is no blueprint, this does not mean that the process in unstructured. Martijn's project follows a Growth Plan that consists of three phases. The first phase, the Incubation phase, revolves around creativity, innovation and exploration. Each stakeholder brings their current knowledge, facilities and innovation potential into a test bed used to create inspiring prototypes, combining textiles and electronics. These prototypes are typically one-offs to be 'tested' with one person.

Successful products move to the second phase, the Nursery phase. This phase tests the concepts, examines the implications of scaling up, and together with the partners explores the business opportunities. Several prototypes are made and evaluated with 10 participants. In the final Adoption phase, the industrial partners take the prototypes of the concepts for further testing and to explore the manufacturing requirements and business implications.

A clear benefit of this approach is the sense of shared ownership. The only way to bring multiple partners together with their different ways of working and thinking is when they feel that they own the project. Instead of it being 'my' project where partners participate in, it is going to be 'our' project.

Prototypes are vital in creating this shared ownership, because partners can see how their own expertise is used in the project. A typical Incubation phase prototype was the 'audio fabric', a smart textile that when touched would play a piece of music through a mobile phone. It was shown during a meeting with Admar Schoonen, an embedded systems engineer from Metatronics. The prototype's unfinished look enabled him to see how the touch sensitive fabric was combined with the electronic components. It also illustrated how the fabric incorporated pressure sensitivity, something that could also be applied in other curved surfaces.

An example of the Nursery phase is the prototype used in discussions with Huub Waulthers, the knitting expert from Textiel-Museum TextielLab. It consisted of stretch-sensitive fabric made interactive by connecting it to a light source. The knitting expert could examine the relation between the knit and the interactivity and offer suggestions of how they could improve it with his knowledge of available production techniques.

Martijn's research is now at a stage where concepts are transitioning towards the Adoption phase.

MARTIJN TEN BHÖMER — *1985*

m.t.bhomer@tue.nl

- PhD candidate at Eindhoven University of Technology, Designing Quality in Interaction
- Member CRISP project Smart Textile Services

p15

YOU MAKE THE RULES!

Prototypes are used for many different purposes during the design process. Martijn uses it as a boundary object in the conversation with different stakeholders. Pepijn uses prototypes to create knowledge on open-ended play. Through building prototypes of possible solutions, knowledge is created.

BR
DOWN
SIL

Christine

As designers, we are often not aware of the implications — and potential ramifications — PSSs can have on an organisation. When designing a PSS, we often only think about the design of the PSS itself, just as we would when designing a product.

In traditional engineering environments, a client approaches a manufacturer with a list of specifications. This company has a clear understanding of what their machines can produce, and consequently they manufacture and deliver the products. We can still see this traditional approach in the case of the textile industry and Martijn . Textile companies think along with their clients and are used to producing yarns and woven goods based on the specifications given. The top figure right illustrates the main concerns of these traditional textile companies.

In the case of a Smart Textile Service, what the company is asked to manufacture is often only a single element within a larger picture. This collaborative approach has become common practice in CRISP projects and other PSSs, however it still presents quite a few challenges for many traditional companies. In Martijn's case, for instance, the textile industry not only has to deal with incorporating smartness, in the form of sensors and electronic circuits, which are all new to them, but they also have to work with an electronic designer, a supplier, a media designer and a healthcare institution. In order to do this successfully, textile manufacturers have to be involved in the design process at an earlier stage, where they not only deal with the client's specifications, but are also confronted with the entire scope of the project. The bottom figure right shows how a company has to restructure itself to implement a PSS.