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Through participation in the apparel industry to innovation

BY

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ABSTRACT

This paper describes a theoretical framework for participatory product development and provides examples of the use of open innovation and mass customization in the apparel industry. The topic is a joint research project between the Department of clothing technology at the University of Applied Sciences Berlin, Germany (HTW) and at the Institute for Vocational Education and Training of the Technical University of Berlin, Germany (TU). The involvement of end users during product development can offer a solution-oriented approach to creating concrete products and improving productmarket fit. It can create products that better meet user needs, cost less, are more novel, and are quicker to bring to market. The industry, therefore, needs to identify the best method for the application of these techniques. The study provides an overview of different participatory methods. From this toolbox of methods, every company will find an individual method to involve users in the development process and to create an emotional connection to the product itself. Case studies in Vietnam and Indonesia help to identify possibilities for participation in the agency business. The sourcing process shows almost no active user participation so far, despite relevant literature on innovation development through participation. The paper gives an overview of how the industry can change the passive role of the user to an active empowerment with autonomous product solutions for innovation development.

Keywords: Product development, participation, open innovation, mass customisation, garment industry

Introduction

With the democratisation of fashion, it is now possible for most of the society to choose their own style of clothing. However, despite the opening of fashion norms, clothing products are still offered in shops as ready-made items. Consumers have little influence on product development.

Users, technology, and innovation are the drivers of new consumer behaviour. Users' demands for innovative apparel products are increasing while the speed of markets remains unchanged. To meet this need for speed in the marketplace, new apparel products can only be successful if they are based on global sourcing processes. The implementation potential of an innovative idea needs to be identified early and brought to market. This will put the apparel industry in a strong position in terms of sustainability and future viability. By participating, the industry takes a first step in product development towards socio-economic transformation: The aim is to open the existing product development methodology to participatory innovation development to enable innovation in the apparel sector at product and process level.

Participation

The term participation is derived from the Latin word "particeps" (= to participate). It describes the involvement, participation or inclusion of citizens and their involvement in processes to influence political decisions (Van Deth, 2003). The essential participation in political decision-making processes shows the political interpretation of the need for participation

(Jochum, 2020). In addition to the historically developed political interpretation of the term, participation can be applied to many areas of life - from the private to the public sphere - wherever participation is required in a relationship of partnership between citizens, participation is the focus. It assumes that, on the one hand, power is relinquished and, on the other, commitment and involvement are introduced.

The involvement of end users during product development can offer a solution-oriented approach to creating concrete products and improving product-market fit. All participation efforts must be aligned with business objectives (Piller, 2017). Participation can then create products that better meet user needs, cost less, are more novel, and are quicker to bring to market (Jochum, 2020). Only products, for which there is already a market demand, are produced, which is a contribution to the sustainable use of resources. Participation is primarily aimed at creating an emotional bond between the product innovation and the company, but a contractual or technical-functional bond can also result from joint development work.

Mass customisation and open innovation

Mass customisation (MC) and open innovation (OI) are innovative strategies that involve customers or external experts in product development and enable interactive value creation. While mass customisation aims at the production of a single personalised product, open innovation aims at the open development of

a new product for a large group of customers (Fuchs, and Tihon, 2019). MC and OI receive little attention from the major players in the apparel industry. Customers remain predominantly in the passive role of recipients (Tihon, 2022). Some companies are testing mass customisation as a complementary concept to their traditional product development (Fuchs, 2014). On the other hand, open innovation approaches are not yet anchored in mass production in the apparel industry.

OI helps to find new ideas in the development phase or to think about products and processes in a different way. For example, ideas from citizen science, where people want to collect data together

Mass-customised products reflect individual needs and at the same time achieve a price that is approximately the same as that of conventional, mass-produced products (Piller, 2017). This is made possible by industrial production with individualised subprocesses. The customer is therefore offered a limited range of solutions. With mass customisation, users determine how their personal fashion product should be designed, which improves the fit to their needs.

at an early stage of the value chain, can be integrated as OI. Figure 1 shows the differences between mass customisation and open innovation in terms of supply chain positioning.



Figure 1. Differences between open innovation and mass customisation Source: Fuchs and Tihon, 2019: p. 143

Examples of participation in the fashion industry with CAD Systems and 3D Simulation

The 3D representation of digital apparel products is used in the agency business to improve communication and collaboration between the focal company and the agency's design department. The aims are among others to give all departments access to the digital product lifecycle, reduce material usage and lead times, and

replace sample parts in the long term. This process can be opened to end users in the digital space. There are many ways to use technology, (from scanning to 3D simulation tools) to get end users involved in product development right from the start. For open innovation structures, users can be measured with the scanner to develop new size systems, create new scanatars or use their own avatars in games. Mass customisation is individualisation before or after

production, which is already possible with the visualisation and measurement of CAD technologies. In mass customisation, individual sizes can be measured and translated into personalised products (made to measure). Another example of 3D for mass customisation is the visualisation of the fashion item with all the details that can be customised by the user - such as embroidery, prints, individual components or even the addition of smart devices.

Methodology

The research works with six steps in research methodology based on grounded theory, as shown in Figure 2. For the case study, a process analysis is chosen in Vietnam and Indonesia as two of the major sourcing countries for the German apparel market. These production countries are important for the mass production of garments, especially for outdoor jackets and component manufacturing. Business-related research surveys how apparel is being developed in the agency business today. The traditional division of labour can be challenged by using scientific research in business. Using the information from the case study, a process analysis of the current product development is carried

out and a theoretical model for a problem-solving approach is developed.

One of the main findings of the case study is that the industry needs a new methodology to get in touch with participative steps in the fashion development process.

Personal research perspective

I did a case study in Vietnam and Indonesia with a fashion agency. They put me in touch with factories and suppliers. All these people behind the process influence the research in all dimensions. My perspective as a white, German researcher affects the way people talk to me and how I decode the information. This intercultural system is behind all our global fashion sourcing. That is why it is important to include this perspective in the research. Of course, there is a formal theory at the end, but it is based on individual statements. We need to understand that sourcing will always be an ethnological and social-scientific construction. Cultural and linguistic differences are also part of the apparel supply chain. I see the people in the case study as partners in collaborative research, and I have shared all the steps of the process with them - from strategy to sewing.

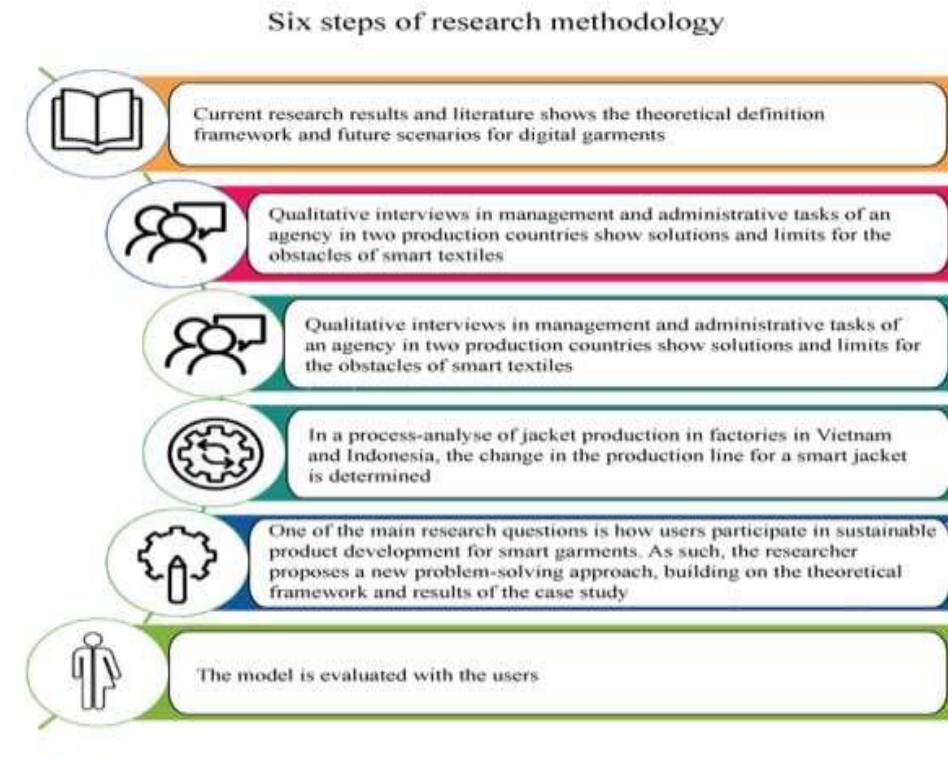


Figure 2. Six steps of research methodology, own figure

Results and Discussion

The basic premise is that none of the product development steps can be completely taken over by the users, as they lack the design and clothing technology know-how. Consequently, the work steps must be prepared for the end user in such a way that no excessive demands are made and the solution space is clearly defined. For some process steps, however, it is not possible to break down the complexity without overburdening the end user. These include "construction and grading", "production planning for series production", "in-line series production" and "shipping". Even "sampling" is not possible for open structures if we think of analogue products. If prototyping is done in 3D simulation,

user involvement is possible. The research identified the process steps in which the end user can be involved. Figure 3 shows the distribution of possible involvement. The product development process diagram does not show the entire life cycle, but only the product development process up to the point of sale. In the context of integrated product development, the use phase and the end of the use of the product must also be considered. The presentation of product Use phase

Since the garment remains entirely in the hands of the user during use, we can no longer speak of participation but of ownership. However, wearing the product in different combinations and on different occasions does intervene in the design process. The product development steps

“trend research and design”, and “mood board and colour definition” are thus changed by the user (compare Figure 3), because they are wearing it in different outfit composition than the designer had planned. Users take the purchased garment out of the collection and integrate it into other compositions. From a design perspective, the individual product appears different in colour and style in the new context. The user's participation, therefore, lies in the combination of the garment with other garments and the styling. The user can make the garment his or her own in different ways and choose the point of individualisation development only refers to the process of bringing a collection to market. Laundry care is the responsibility of the user. The right care influences the length of the use phase as well as the life cycle assessment of the product. The user plays a key role in laundry care, as the choice of wash programme, the composition of the load and the detergent determine the wash result and the resources used to achieve it (Ellmer, 2016).

Open product development in the agency business

The process analyses in the agency business show that there is no active involvement between product development and the end consumer. It is common to have a **passive involvement** with mostly data analysis in the beginning (for example with sales figures, previous purchases and loyalty cards). Some brands use prototypes for user testing. After the sale, brands ask for customer feedback (compare Figure 3). During the lifecycle of the garment, users do not share much information with the brand or research.

If we have a look at the market, the only used **active integration** in the value chain is mass customisation, but in the agency and its cooperating factories in the case study, there is only mass production without individualisation. Batch size one is not an option for the factories now. There are some examples of mass customisation in the market, but if you compare it with the numbers of mass production, it is not economically viable. You can find mass customisation in changing colours, embroidery or prints etc. Big brands use MC for their image - to show that they are innovative and able to customise. Open innovation, where the end user as a customer can be a partner in the development process, does not exist. The only OI is shown in B2B, such as retail with brands, where the salesman's-samples are changed, which influences the product development.

Method Toolkit

The current process shows almost no possibility of active user participation at the beginning of the development process in the value chain, despite relevant literature on innovation development through participation. At the same time, the development of future garments has to adapt to the current structure of the value chain. To make participation tangible and manageable for the market, methodological education is needed. Each company will find a different way to involve users in their process and create an emotional connection to the product itself. With a toolkit of methods, companies can find the methodology of participation for their individual problem: For example, in the

beginning, we can use different methods of Open PLM, Open Innovation and Crowdsourcing to let users be part of the value chain for fashion. Processes and products can be created collaboratively in open structures. For active innovation during sales and use, we can use toolkits for lead users or mass market.

This paper provides only a brief overview. The research has built a methodology toolbox with over 75 methods from political citizen participation, quality management, product management, design thinking and interactive value creation. The different methods are brought together to be used in the working cycle for fashion product development.

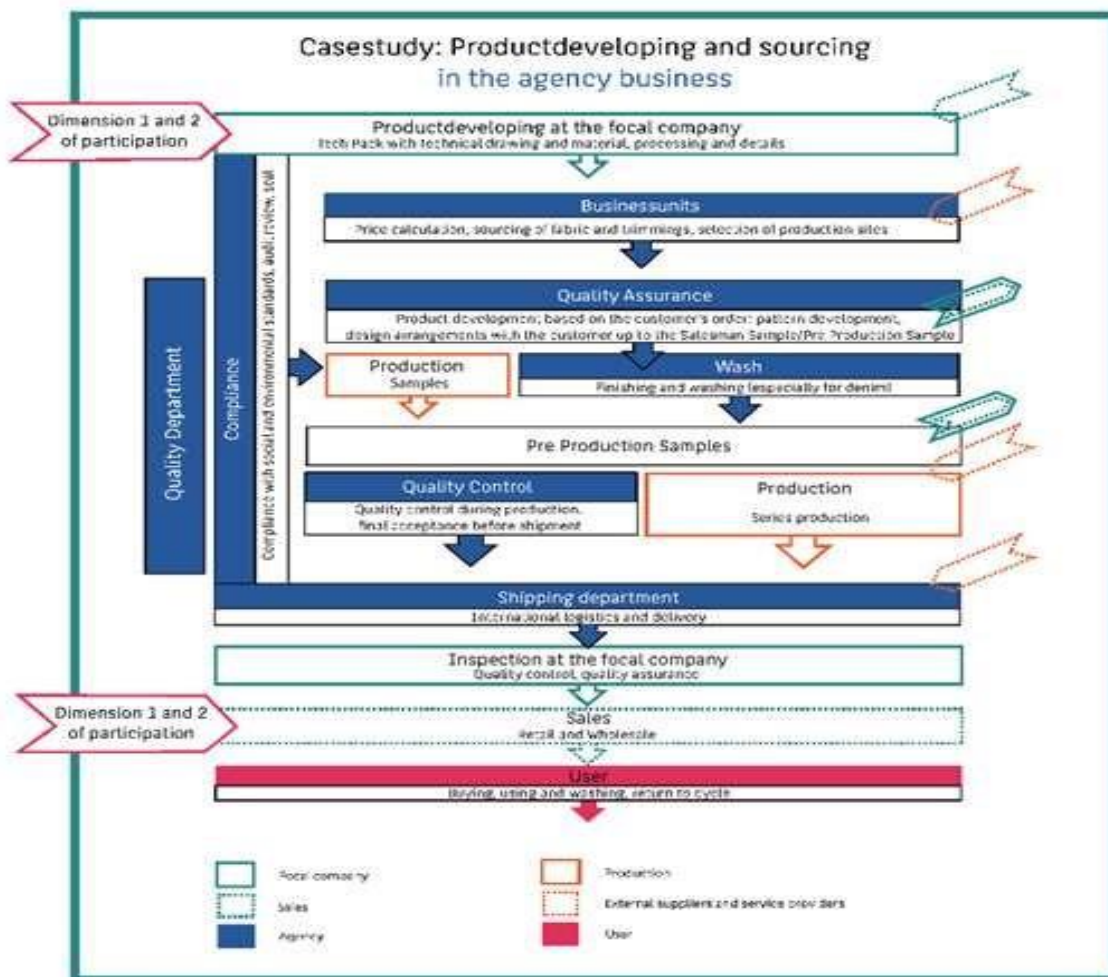


Figure 3. Product development in the agency business, own figure

Open product development in the agency business

The research develops a methodological toolkit to change the passive role of the user

into active empowerment with autonomous product solutions. It is therefore important to define the dimensions of user participation: Figure 4 shows the

dimensions of participation in the consumer goods market resulting from the synergy of political participation and customer integration. In dimensions one and two, the

of products and innovations. Dimensions three to six increasingly describe the active role of the user.

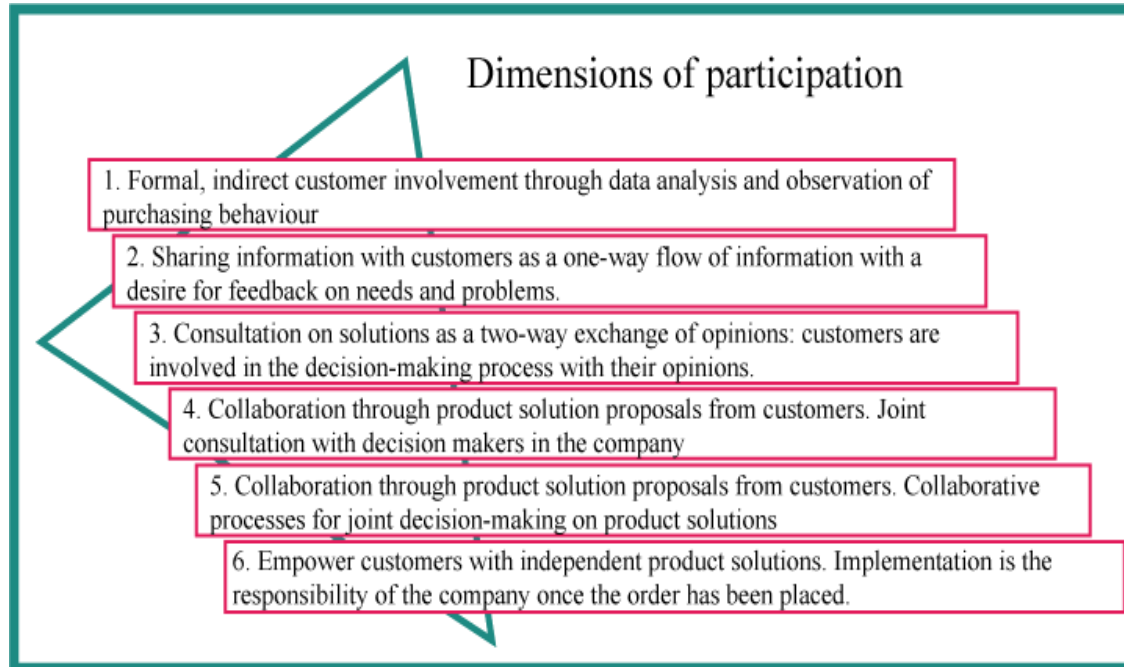


Figure 4. Dimensions of participation Source: own figure based on Knöchel and North (2018); Brinkerhoff and Goldsmith (2000)

user still plays a passive role in the creation

Conclusion

The research explores the paradigm shift from the traditional product development of garments to the integration of customers in the innovation process of product development. Each company will find a different way of involving users, depending on the problem that the innovative garment is intended to solve.

Recommendations

During the practical research, the cooperating factories focused on mass

production and showed no possibility of individuality. In the research outlook, this perspective shows that if the market wants individualised products, the way fashion is produced needs to be rethought or the common ideas about individualisation need to be changed. The practical case study showed that open structures for involving endusers in the product development of fashion items are not common in the industry. This is a great opportunity for new research topics and collaborations with the industry.

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