



# Product, process, marketing and organizational innovation in industries of the flat knitting sector

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## Abstract

Innovation practice contributes to economic development by fostering the development of new markets and the improvement of existing markets. This study aimed to identify the innovations in the flat knitting industry that occurred between 2008 and 2011. This applied nature study considers both qualitative and quantitative approaches with exploratory and descriptive purposes as its research method. A survey addressed to managers of 23 flat knitting industries was conducted. Data analysis was carried out in two stages: in the qualitative stage, content analysis of the interview was performed, while in the quantitative stage, a descriptive quantitative analysis through correlation statistics was used, in order to identify the level of relationship between the variables of the theoretical construct. The results of the qualitative stage showed that the flat knitting industry invests in innovation compatible with the market demands and fashion trends. The quantitative results identified relationships among the variables named annual turnover, number of employees and amount invested in marketing innovation. In addition, correlations were also observed among the variables skilled workforce and amount invested both in product and organizational innovation, and a relationship was identified between amount invested in product innovation and amount invested in marketing innovation.

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## Introduction

Brazil is one of the few developing countries that has internalized all activities of the textile complex, in addition to manufacturing a wide range of products in such a manner that supplies all the market segments. The internalization occurred from the raw materials' production (natural and chemical fibers) to clothing production. The segments that have become more

modernized are those which manufacture textiles for domestic purposes and the knitting mills (Scherer & Campos, 1996).

Not only has the textile and clothing industry been studied nationally and internationally, but also by its sector, in pursuance of understanding the links within the textile and clothing chain, or the chain as a whole, as it happens for the flat knitting industry, which is part of the textile chain (Vogt, 2003).

According to the Industrial Marketing and Studies Institute (IEMI), the industrialization process in Brazil began with the textile industry. Its history and roots preceded the Portuguese arrival and colonization, since the natives inhabiting the country had already developed and had been using artisanal and primitive techniques, such as hand weaving plant fibers to produce coarse fabrics with the purpose of protecting their body (IEMI, 2014).

Such sector is relevant since it represents 5% of the manufacturing industry's gross domestic product and generates over 10% of jobs within this economic activity. One of the most significant

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contributions of the textile and clothing sector is the generation and distribution of income, therefore improving the living conditions of the Brazilian population while contributing to the following results: (a) it provides more than eight million direct and indirect jobs; (b) it creates first employment opportunities to inexperienced workers; (c) it is the main employer of women who are heads of household; (d) it engages all levels of the social and educational pyramid; and (e) it is a consistent alternative for income transfer programs (ABIT, 2011).

The diversity of prints, colors and patterns, the creative design, the manufacturing versatility, the sustainability and the knowledge of the links within the chain are some of the features which draw attention to Brazilian fashion overseas while helping to boost the country's image on the international market. The negotiations of Brazilian brands abroad from TEXBRASIL Program (Brazilian Fashion Industry Internationalization Program) go beyond US\$ 330 million (IEMI, 2014). In this study, Caxias do Sul was chosen because it has one of the biggest National Knitting Centers, which mostly consists of flat knitting industries. Therefore, Caxias do Sul has been referred as the Knitting Capital of Brazil.

With regard to the relevance of the subject, authors such as Schumpeter (1912) state that innovation is the result of the establishment of inventions and knowledge made available to organizations which are driven by the pursuit of competitive advantages via an economic impact. In this context, innovation is understood as a new framework for the textile sector, because it can occur in any economic sector, including government services. However, the guidelines are geared toward the innovation of commercial companies, manufacturing industries, primary industries and the service sector (OECD, 2005).

The social and academic relevance was one of the criteria used for defining this research theme, given that the studied sector is socially relevant by generating jobs and is academically relevant since the innovation in this sector is directly involved with the academia, due to partnerships with the university in order to develop research projects for students' engagement.

Considering that innovation is the driving force for economic development in a capitalist system, this study intended to approach this subject, while aiming to identify the variables that influence innovation in flat knitting industries seeking to achieve excellence as well as economic and social performance in the sector.

This study aims to address innovation in organizations belonging to the flat knitting sector of Caxias do Sul. Particularly, a set of variables were selected in order to identify the existence of relationships among them and innovation and to observe how innovation took place from 2008 to 2011.

Also, the study focused on discussing the four innovation dimensions (product, process, marketing and organizational) in companies belonging to the flat knitting sector of Caxias do Sul. The variables skilled workforce, number of employees and turnover were studied with the purpose of identifying their relationship with innovation during the studied period.

Given the context of the textile industry in Brazil, this study's guiding question was: Which innovations and dimensions of innovation were employed by the flat knitting sector of Caxias

do Sul during the period from 2008 to 2011 and what is the relationship between innovation and the industry variables? The hypotheses postulated and tested in this research intended to verify the relationship among the variables skilled workforce, turnover and number of employees with the variables amount invested in product innovation, process innovation, marketing innovation and organizational innovation.

The objective of this research was to identify the innovations according to the four dimensions of the Oslo Manual (2005) and the relationship with the industry's variables on the industrial flat knitting sector of Caxias do Sul.

In order, to achieve the proposed objectives, the following stages were performed: (a) description of the flat knitting industrial sector of Caxias do Sul; (b) identification of innovations based on the Oslo Manual (2005); (c) classification of the innovation concept during the qualitative phase of the study via content analysis of interviews; (d) usage of correlation statistics in order to identify the relationships between innovation and industry variables in the quantitative phase.

The qualitative results indicated that the flat knitting sector of Caxias do Sul invests in innovation in a manner that is compatible with the market demands and fashion trends. The quantitative results identified correlations among the following variables: annual turnover with number of employees and amount invested in marketing innovation; number of employees with amount invested in marketing innovation; skilled workforce with amount invested both in product and organizational innovation; amount invested in product innovation with amount invested both in marketing and organizational innovation.

Next, the study brings an in-depth description of the theoretical constructs about product, process, marketing and organizational innovation, as well as about the Brazilian textile industry. The following section discusses the methodology employed for data collection and analysis. After that, the research results are presented along with their analysis. Finally, there is the conclusion section in which the study is completed considering the proposed objective and the limitations of the research and future research suggestions are indicated.

## Literature review

### *Innovation*

In 1912, a development of the conceptual approach to innovation occurred, which was broadened due to Schumpeter's work. According to Schumpeter (1934), innovation is the action of innovating and creating processes which promote the disruption of the economic system while allowing the emergence of novelties.

In capitalist economies, economic development is driven by the impact of technological innovations, which occurs through a dynamic process of "creative destruction". In this context, innovation is described as the creation of something novel by destructing what is becoming obsolete while challenging the idea of economic balance, as described in the neoclassical theory (Schumpeter, 1934).

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