



7th Conference on Learning Factories, CLF 2017

Changing requirements of competence building due to an increase of personalized products

Erwin Groß^{a*}, Jörg Siegert^a, Thomas Bauernhansl^a

^a*Institute of Industrial Manufacturing and Management, University of Stuttgart, Allmandring 35, 70569 Stuttgart, Germany*

Abstract

This article discusses the development of Taylorism from classical Taylorism to New Taylorism (Digital Taylorism) and leads to rethinking the development of Taylorism. The increasing individualization of products and shorter product life cycles lead to an increasing demand on the qualification of the workforce in production. With an increasing individualization, conventional methods of capacity-building, especially those based on the principles of division of labor and standardization of work content in production, are becoming impractical and inefficient. New areas of competence must be created in which employees will be able to plan and produce products in co-operation with the customer and handle the sales orders. This inevitably leads to a reversal of Taylorism.

© 2017 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer review under responsibility of the scientific committee of the 7th Conference on Learning Factories

Keywords: Factory management; Professional training; Information management

1. Introduction

This article addresses the limits of Taylorism in mass customization. Due to an increasing complexity as a result of the increasing individualization of products, standardized work flows and their fragmentation as known from mass production and serial manufacturing reach their economic limits. Work contents need to be reviewed and reorganized. The way of developing the workforce's competencies must be re-designed. Workers need to be classified in areas of competence which not only regard their technical and methodical expertise but also personal, activity-oriented and socio-communicative competences [1]. This will make them able to adequately react to unknown tasks like designing and manufacturing customized products.

* Corresponding author. Tel.: +49-711-970-1054; fax: +49-711-970-1220.
E-mail address: Erwin.Gross@iff.uni-stuttgart.de

2. Motivation

The increasing product variety not only demands for smaller but still cost-effective lot sizes. It also poses a challenge regarding the competences and qualification of the workforce. Simple products usually manufactured mechanically in large quantities tend to be replaced by more complicated and complex ones due to individual customers' demands, see fig. 1.

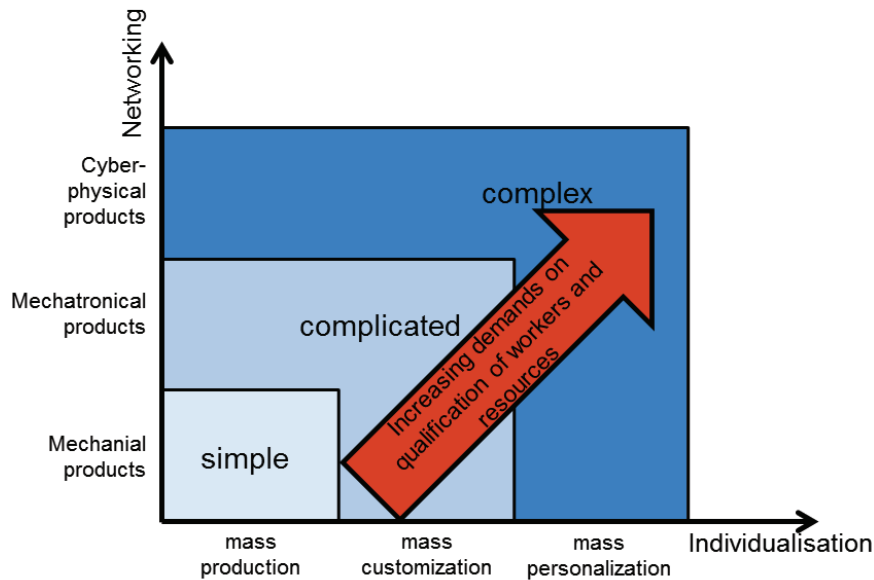


Fig. 1. Development of production [2]

The more customized a product becomes, the more complex and often inefficient becomes its production [2]. Issues are defined as complicated if they consist of many different elements which are interlinked. Complicated issues may be calculated and predicted. Complex issues, on the other hand, consist of networked elements that mutually interact, which makes it hard to calculate them [3]. This complexity is also valid for mass customization, see fig. 1. From a list of predefined options the customer configures an individual product which is then manufactured [4]. Mass Customization means the linking of Mass Production with an individualized customer-defined production (Customization). Its objective is an individual product manufactured under the conditions of mass production but hardly more expensive than a conventional product [5, 6]. Piller describes Mass Customization as the „production of goods and services which meet the different requirements of each single customer, efficiently like a comparable mass or serial production. The basis of the value process is a co-design process defining the individual performance in interaction between provider and customer.” [6] Mass Personalization, on the other hand, is about products which exactly meet the customer requirements [4]. Mass Personalization refers to manufacturing personalized products at the cost of mass production. It aims at the individual customer and their personal requirements [2, 7]. In order to execute this co-design process efficiently, the production workers skillsets need to be extended. This extension of the workers' skillsets aims at ensuring efficiency and will be a prerequisite for a company's long-term competitive advantages.

One possible way of extending the skillsets may be fluid competence areas which classify workers according to their qualification. These fluid competence areas not only include the technical and methodical expertise but also personal skills, activity-oriented and socio-communicative competences. These four types of competence according to Erpenbeck and Sauter, if adequately combined, will enable workers to execute the co-design process for the definition of the customized performance. This will lead to eliminating current forms of labor division and

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات