Forms and functions of standardisation in production systems of the automotive industry: the case of Mercedes-Benz

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Abstract (for German summary refer to Appendix 1)
In January 2000, Mercedes-Benz started to implement the Mercedes-Benz Production System (MPS) throughout its world-wide passenger car plants. This event is exemplary of a trend within the automotive industry: the creation and introduction of company-specific standardised production systems and marks the starting point of the present study.
At the core of it is a case study about the Mercedes Benz Production System (MPS). The goal of the study is to contribute to the debate about production systems by examining the social and economic implications of the role of standardisation in production systems. In this context it addresses three core questions:

1. What are the driving forces behind the changing forms and functions of standardisation and what role do institutions play in this process ?
2. Second, what impact does standardisation have on the evolution of production systems in the automotive industry ?,
3. Derived from Adler and Cole's notion of the "learning bureaucracy", how do standards influence the work of actors on the shop floor: do standards contribute to organisational learning processes or do they continue to serve as control tools intended to regulate the work of actors on the shop floor ?

The first two questions will be examined in two parts based on historically-genetic arguments, the third question will be analysed on the basis of my own empirical research and surveys conducted as part of the company-focused case study of the Mercedes-Benz Production System (MPS).
The second chapter thus focuses on the rise of standardisation, particularly in context to the development of quality standards in Germany, American and Japan, and analyses the role of institutions in this process. Its findings state that; companies and customers have driven the standardisation process and specifically war, and that the protection of national industries, globalisation and quality, are the main driving forces of standardisation.
The third chapter explores the role of standardisation in the evolution of production systems in the automotive industry covering the transition from craft production to mass production and Taylorism, and the three major production systems which evolved in the twentieth century: Ford's system of mass production, the Toyota Production System and the reflective production system of Volvo Uddevalla. It shows that standardisation has played a major role in the evolution of production systems in the automotive industry and that the Toyota Production System has emerged as the dominant model upon which currently introduced standard production systems are modelled.
The case study about the Mercedes-Benz Production System is presented in two parts. In chapter four, an analysis of the process of formalising the MPS, its implementation and support organisation, the role of audits, and a comparison with existing methods of work and also the Toyota Production System is given; in chapter five, the empirical findings of two surveys conducted during the implementation period of the MPS are presented. The notion that standardisation contributes to more control over the work of actors on the shop floor (alienation image of work) is not confirmed by the findings. In contrast, the findings show that know how and experience of actors on the shop floor is integrated into standards and thus standardisation facilitates organisational learning.

Declaration

I declare that this thesis has been composed by myself and that the research reported has been conducted by myself unless otherwise indicated.

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3K	Kitanai (dirty), Kitsui (stressful) and kiken (dangerous)
A4	DIN Norm for standard paper size
AAM	Alliance of Automobile Manufacturers
AG	Aktiengesellschaft
AGV	Automatic Guided Vehicle
AIAG	Automotive Industry Action Group
ANS	American National Standard
ANSI	American National Standards Institute
AQL	Acceptable Quality Level
ASQC	American Society for Quality Control
AT&T	American Telephone and Telegraph Co.
BBB	Better Business Bureaus
BMW	Bayerische Motoren Werke
BNS 5750	British National Standard
BSI	British Standards Institute
CAMI	Joint venture between Suzuki and GM
CCS	Civil Communications Sections
CD	Compact Disk
CEN	Comité Européen de Normalisation
CEN/TC	Comité Européen de Normalisation / Technical Committee
CEO	Chief Executive Officer
CIP	Continuous improvement process
CNC	Computer numerically controlled
COS	Chrysler Operating System
DC	DaimlerChryler
DCPS	Daimler Chrysler Production System
DIN	Deutsches Institut der Normierung
DIN EN ISO 9000	Deutesche Institut der Normierung European Norm International Standard Organisation
DM	Deutsche Mark
E5	Ebene 5
EDP	Electronic data processing
EFQM	European Federation of Quality Management
EPS	(Opel) Eisenach Production System
EU	European Union
FAKRA	Fachnormenausschuss Kraftfahrzeugindustrie
FMEA	Failure Mode Effects Analysis
GBR	Gesamtbetriebsrat
GHQ	General Head Quarter
GM	General manager
IEC	International Electrotechnical Commission
IFAN	Internationale Föderation der Ausschüsse Normenpraxis
IFT	International Automotive Task Force
ISA	International Federation of the National Standardizing Assocation
ISO	International Standards Organisation
ISO/TC	International Standards Organisation / Technical Committee
ISO/TS	International Standards Organisation / Technical Standard
JIS	Japanese Industrial Standard
JIT	Just in time
JMA	Japan Management Association
JSA	Japan Standards Association
JUSE	Japanese Scientists and Engineers
KVP	Kontinuierlicher Verbesserungs Prozess
MD	Median
MDS	Mercedes-Benz Development System
MIT	Michigan Institute of Technology
MPS	Mercedes-Benz Production System

MTM	Methods Time Measurement
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organisation
NC	Numerically controlled
NSBs	National standards body
NSCC	United Nations Standards Coordinating Committee
NUMMI	New United Motor Manufacturing Inc.
PDCA	Plan, Do, Check, Act
PMI	Post merger integration
PSA	Peugeot Citroen S.A.
PWS	Production Work Shop
Q101	Quality standards 101
QM	Quality management
QMC	Quality management centre
QS	Quality standard
R&D	Research and development
RADAR	**R**esult, planning and developing of **a**pproaches, **d**eploying approaches, **a**ssessment and **r**eview of approaches
REFA	Reichsausschuss für Arbeitszeitermittlung Today REFA - Verband für Arbeitsstudien und Betriebsorganisation
REZEI	Reorganisation der Zeitarbeit
ROQ	Return on quality
RPS	Rastatt Produktionssystem
SDCA	Standardise, Do, Check and Act
SPC	Statistical process control
SPSS	Statistical Package for the Social Sciences
SQC	Statistical Quality Control
SWI's	Standard work instructions
TPS	Toyota Production System
TÜV	Technischer Überwachungs Dienst
TVR	British Sports Car Manufacturer
UAW	United Auto Worker Union
UK	United Kingdom
US	United States
US MIL-Q 9858	United States Military Quality Standard 9858
USA	United States of America
USD	United States Dollar
VDA	Verein Deutscher Automobilhersteller
VDA-QMC	Verein Deutscher Automobilhersteller Quality Management Centre
VPK	'Verkehrstechnische Prüfungskommission''
VW	Volkswagen

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