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Christoph Streb, Sven Voelpel, Marius Leibold*

Aging Workforce Management in the Automobile Industry: Defining the Concept and its Constituting Elements**

This paper presents the results of a grounded theory study on the automobile industry aimed at developing a concept of aging workforce management by identifying and constructing its constituting elements. Through an in-depth research investigation, it answers the question of how the challenge of an aging workforce can be defined, and the related broader managerial issues that arise in the context of one specific industry.

Our findings suggest that the quest for 'competitiveness' is the major constituting element of the concept of aging workforce management. Interdependent with this are two secondary elements that encompass the actual challenge: measures that drive competitiveness and symptoms of the aging workforce. Three further 'residual elements' making up the six constituting elements of the construct are then outlined. Issues for future research are suggested, including extending such studies across other industries, and operationalizing the construct of aging workforce management by explicating the dynamics among its constituting elements.

Aging Workforce Management in der Automobilindustrie. Definition und konstituierende Elemente

Die vorliegende Arbeit ist das Ergebnis einer Grounded Theory Studie in der Automobilindustrie mit dem Ziel, die konstituierenden Merkmale des Aging Workforce Managements zu bestimmen. Dabei wird untersucht, wie die Herausforderung einer älter werdenden Belegschaft in diesem speziellen Umfeld zu definieren ist und welche weiteren Problemfelder eine Rolle spielen.

Die Ergebnisse der Studie zeigen, dass die Zielsetzung der Wettbewerbsfähigkeit der Unternehmen eine zentrale Rolle für das Thema Aging Workforce spielt: Alle weiteren Elemente zielen entweder darauf ab diese herzustellen, oder werden von den Auswirkungen einer älter werdenden Belegschaft negativ beeinflusst. Die Resultate dieser Studie bilden den Ausgangspunkt für weitere Untersuchung auf diesem Gebiet. Darin sollen die Zusammenhänge zwischen den in diesem Beitrag dargestellten konstituierenden Elementen untersucht und die Ergebnisse auf andere Industrien erweitert werden.

**Key words: aging workforce management, grounded theory,
automobile industry**

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1. Introduction

Together with the globalizing nature of the worldwide economy, the aging of the workforce is recognized as one of the most significant factors to affect organizational reality in many industrialized countries. This is unlikely to change in the foreseeable future (DeLong 2004; Dychtwald/Erickson/Morison 2006; Leibold/Voelpel 2006; World Bank 1994). Whereas within the traditional managerial mindset, globalization requires organizations to perpetually compete in terms of performance indicators such as productivity, efficiency, increased cost advantages, as well as superior products – i.e. they have to strive for increased competitiveness (Krugman 1995) – the aging workforce adds a challenging new aspect: management is becoming concerned with workers' physical and mental performance, specifically that of employees beyond the age of 45. Academic researchers, too, wonder whether an older workforce can perform exacting physical and mental tasks as productively and efficiently as a relatively younger one.

Questions such as these have led to an increasing number of companies introducing what is called 'aging workforce management'. This basically refers to the development, implementation, and application of tools and measures to sustain or even improve organizational competitiveness, despite an increase in the workforce's average age and its resulting age-related challenges.

While there have already been multiple research studies into the older workforce's mental and physical abilities (e.g. Delgoulet/Marquie 2002; Freudenthal 2001; Reed/Doty/May 2005), our literature research indicates that there is a substantial gap in both managerial practice and research regarding what aging workforce management actually constitutes (Streb/Voelpel/Leibold 2008). Aging still seems to be a conundrum for most organizations and they consequently apply conventional management tools to its anticipated challenges.

In view of the automobile industry's specific concern about physical job performance, we applied a grounded theory approach to answer the questions of what elements actually constitute aging workforce management, i.e. how the challenge of the aging workforce can be defined, and what the specific related issues are with which management has to deal.

Grounded theory is perceived as being especially useful in areas of study where little scientific work has been conducted, and when the research lacks specific theories on which to build – as in our research topic (Charmaz 2005; Goulding 1999). Our findings would therefore serve as a basis on which to build further, more specialized research.

Our work is presented in four main sections. In the first, we provide the reader with a literature review to illuminate the existing research gap in aging workforce management. In the second, we describe the applied grounded theory methodology and provide details of the data collection and analysis. The third section presents our results as we answer the research questions and the further managerial issues arising from them. Finally, we provide suggestions for further research into the construct and dynamics of aging workforce management.

2. Research gap

Research on older workers is manifold and stretches across various disciplines. Psychology, for example, seems to be a field that is particularly interested in aging, especially with regard to cognitive performance (e.g. Salthouse 1996). However, as implied in the introduction, there is a significant gap regarding research on the aging workforce from a management perspective.

When reviewing the relevant studies, it becomes apparent that the increasing average age of the available workforce has changed society (Bureau of Labor Statistics 2007; United States General Accounting Office 2003). The potential related challenges have also been predicted for years - even in management research (Batten 1980; Leonard 1989; Paul/Townsend 1993; Sonnenfeld 1978). Basically, the current literature can be categorized into two general categories:

- Those studies concerned with the loss of knowledge that might result employees moving into retirement en masse; and
- studies dealing with the potential physical shortcomings of older workers.

DeLong (2004) has provided seminal research on the loss of knowledge in older workers. By starting with practical examples from business where the retirement of experienced workers and employees is already threatening the loss of important know-how, he develops approaches with which to react to the challenge. Congruent with this work, Dychtwald/Erickson/Morison (2004; 2006) ask that current retirement practices be reconsidered and emphasize the potential future shortage of skills and talent. Influenced by studies such as these, some authors insist that age stereotypes should be abandoned and that the value to appreciate older employees can add to the organization be appreciated (e.g. Beier/Ackerman 2005; Chiu/Chan/Snape/Redman 2001). Paul/Townsend's (1993) study is a popular example of works that challenge common myths about the aging workforce and provide suggestions on how to employ them appropriately.

Various studies on the employed older workforce argue that there is no significant decline in older employees' mental skills – provided appropriate training is given – although physical job performance does decrease significantly with age (e.g. Kanfer/Ackerman 2004; McEvoy/Cascio 1989; Waldmann/Avolio 1986). This implies that in an industry, such as the automobile industry, that relies on physical labor to a significant extent and on which we focus in this article, an aging workforce does indeed threaten competitiveness (e.g. Avolio/Waldmann 1990; Avolio/Waldmann/McDaniel 1990; Davidson/Worrell/Fox 1996; Lawrence 1988).

Even though workstations' ergonomic quality has significantly improved in automobile production (as well as in most other industries), thus making physical production tasks more efficient (Genaidy/Salem/Karwowski/Paez/Tuncel 2007), the aging workforce's physical job performance and its influence on competitiveness are still its most important concerns. This is despite the undisputed importance of knowledge workers in a global knowledge and innovation-driven economy. This is also widely acknowledged in management research studies (Davenport/Leibold/Voelpel 2006; Lam 2000; Leibold/Probst/Gibbert 2002).

While the identified works are highly valuable they fail to identify what actually constitutes the challenges behind an older workforce and how these should be addressed in practice. This research gap clearly calls for research to explore aging workforce management. In the following section, we introduce our research approach, which is one step in this direction.

3. Research methodology

Glaser/Strauss (1967) define grounded theory as the “discovery of theory from data systematically obtained from social research” (p.2) and propose a comparative method for developing theory that is rooted in symbolic interactionism (Goulding 2000; Suddaby 2006). This includes an inductive approach, which allows theory to evolve during the actual research via a process of constant (comparative) analysis and data gathering (Charmaz 1983; Glaser 1998; Strauss 1987; Strauss/Corbin 1994). This qualitative research approach is suitable for novel topics as it requires a high level of testability and empirical validity (Eisenhardt 1989), especially where people’s different viewpoints need to be integrated and where there are causal interferences in the specific local and cultural contexts (Miles/Huberman 1994). There are several reasons why this approach was followed to answer our research question:

In the automobile industry, the topic of the aging workforce is generally a sensitive one, as it touches on controversial human resource management objectives during times of cost saving and personnel backlogs. The topic is also still relatively new on most organizations’ managerial agenda – despite decades of research – (e.g. Batten 1980; Leonard 1989; Paul/Townsend 1993; Sonnenfeld 1978) and we therefore did not expect to find elaborated and detailed information.

Under these circumstances, it is difficult to isolate and identify organizational practices by means of conventional, quantitative research methods. Identifying the constituting elements of aging workforce management would therefore require a specific research approach that would allow the researcher to actually enter the world of the object or individuals under study. This would allow interactions to be interpreted, facilitate theory building, and allow an analysis of the underlying human interaction processes (Goulding 1999; Hutchinson 1993; Strauss/Corbin 1994). Grounded theory research meets all these criteria. In consideration of the width and breadth of the available data, we consequently applied the basic methodological concept of open, axial, and selective coding.

3.1 *The sample*

The importance of the sample for the results of our research approach cannot be underestimated (Miles/Huberman 1994). In grounded theory, sampling is understood as theoretical sampling as apposed to statistical sampling (Ragin 1994). Therefore, triangulation during the analyzing process will itself determine sample size and depth. The process of sampling ends when the data are saturated, i.e. when no new findings can be derived from additional information and increasing the sample would not provide any new insights.

In order to deepen our understanding of the essential constituting elements of aging workforce management in the automobile industry, we contacted well-known

manufacturers in the major European car producing nations. After gaining access, we talked to managers, union representatives, and common employees. The choice of interviewees initially depended on whom the organization regarded as an expert in the specific field and who would subsequently be recommended by the interview partners as a continuative and valuable source of information with regard to the specific issues emerging during the actual interview. This is in accordance with Glaser and Strauss's paradigm of theoretical sampling, which, through the crystallizing theory characterizes the process of data collection as "controlled" (Glaser/Strauss 1967). We were often limited to one or two people in a specific organization, although, in one case, we were able to gain access to several interviewees in one producer's various plants.

Table 1: Background on sampled interviews (n=30)

Interview Code Number	Function of Interviewee	Department of Interviewee	Organization of Interviewee
n1	Staff Manager	Human Resource Management	DaimlerChrysler Sindelfingen
n2	Operations Manager	Human Resource Management	Aston Martin Lagonda Ltd.
n3	Company Medical Officer	Health Management	DaimlerChrysler Bremen
n4	Operations Manager	Production	Karmann AG Osnabrück
n5	Head of Department	Human Resource Management	BMW Leipzig
n6	Staff Manager	Human Resource Management	Rolls-Royce Motor Cars Westhampnett
n7	Plant Manager	General Management	DaimlerChrysler Bremen
n8	Head of Department	Human Resource Management	Aston Martin Lagonda Ltd.
n9	Company Medical Officer	Health Management	DaimlerChrysler Bremen
n10	Staff Manager	Human Resource Management	DaimlerChrysler Rastatt
n11	Staff Manager	Human Resource Management	Karmann AG Osnabrück
n12	Employee	Works Council	Adam Opel AG Rüsselsheim
n13	Staff Manager	Human Resource Management	DaimlerChrysler Bremen
n14	Foreman	Production	DaimlerChrysler Bremen
n15	Head of Department	Human Resource Management	DaimlerChrysler Rastatt
n16	Company Medical Officer	Health Management	DaimlerChrysler Bremen
n17	Company Medical Officer	Health Management	DaimlerChrysler Bremen
n18	Head of Department	Human Resource Management	Volkswagen AG Wolfsburg
n19	Employee	Health Management	DaimlerChrysler Bremen
n20	Head of Department	Logistics	McLaren Technology Center Woking
n21	Head of Department	Human Resource Training	DaimlerChrysler Bremen
n22	Worker	Maintenance	GM Powertrain Kaiserslautern
n23	Staff Manager	Human Resource Management	DaimlerChrysler Bremen
n24	Employee	Quality Management	GM Powertrain Kaiserslautern
n25	Employee	Health Management	Volkswagen AG Braunschweig
n26	Head of Department	Health Management	DaimlerChrysler Bremen
n27	Staff Manager	Operations Management	DaimlerChrysler Bremen
n28	Employee	Works Council	GM Powertrain Kaiserslautern
n29	Company Medical Officer	Health Management	DaimlerChrysler Mannheim
n30	Head of Department	Human Resource Management	DaimlerChrysler Sindelfingen

Table 1 provides an anonymized overview of the interviewees, their function, department and their affiliation. Altogether, we conducted 30 interviews in thirteen different facilities. This included major automobile manufacturers, as well as smaller, mostly handcrafting, automobile producers.

Although the latter could be considered as differing from major producers in certain ways, this added to our sample by generating a more comprehensive picture of the issues and their differing impacts. We, for example, explicitly presumed that employees of smaller handcrafting producers face different physical work demands than those working for mass producers.

3.2 Participant observation

Early in 2005, we chose one large automobile manufacturer for an in-depth preliminary data gathering, not only in terms of interviews conducted but also in terms of our personal involvement within the organization (Jorgensen 1989) by means of participant observation. The advantage of participant observation is that it allows meanings and perspectives to be better identified and evaluated than other research methods (Snow/Thomas 1994). Moreover, the researcher is closer to the phenomenon being analyzed, while simultaneously maintaining a professional distance (May 1997). Furthermore, the phenomenon can be studied in real time, in its actual organizational context (Emory/Cooper 1991).

As an official part of the organization, but with a clear focus on passive observation (Dane 1990), one of this paper's authors worked for a time as a blue-collar worker on one of the large car manufacturers' production lines. In order to personally experience the 'whole picture', the author gradually moved up the hierarchical levels within the organization. On a team leader level, he moreover participated in and observed lean-production projects and the introduction of new assembly line procedures focused on the aging workforce. Ultimately, he joined the actual project management team that manages and controls the application of aging workforce measures at the plant and headquarters level. Consequently, we were able to gain particularly valuable insights into this specific company's organizational structures and culture, as well as insights into the actual implementation of aging workforce management in the automobile industry.

3.3 The interviews

The semi-structured interview guideline that we applied for the data collection was the result of our participant observation at one of the sampled organizations and a related literature review prior to the actual interviews. With this guideline, and in accordance with Yin's (2003) principles, one of the authors interviewed managers, union and/or shop committee members, and workers (Healey/Rawlinson 1993). Since we wanted to avoid bias in the context of sensitive human resource management issues, we abstained from audiotaping most of the interviews to benefit from a more comfortable and upfront interview atmosphere. The interviewees appreciated this approach greatly. We did, however, make a record all of the interviews immediately afterwards and filed a complete protocol for the subsequent coding and analysis with the help of notes taken during the interview. To ensure the validity of our data, all interview protocols, as well as preliminary results, were submitted to the interviewees for verification and approval.

In our interviews, we first attempted to discover to what extent the aging of the workforce is already perceived as an organizational challenge, and how the topic is operationalized, if at all. The questions that we asked ranged from whether there would in fact be a demographic change in the workforce, how this would be operationalized in everyday business, how the general awareness of the topic was perceived, whether it received top management attention, whether it had been introduced to the organization top-down or bottom-up, whether the physical or the knowledge dimension was at

the forefront of concern, whether a specific toolbox had been developed to manage the topic, and the status of related projects.

From there, we moved our investigation into the fields of strategies, organizational practices and tools aimed at managing the problems associated with this particular demographic change. We identified major organizational drivers and hurdles of this topic, as well as other key indicators that might give us a picture of how this challenge is being addressed and what the status of relevant projects was. We assumed that we would better understand how the aging workforce was actually managed if we knew more about the people and/or the circumstances that consciously and subconsciously drive or hinder it. We also wanted to know more about the relationship between unions and management with regard to this challenge, exactly what procedures were being implemented, and how the implementation process was proceeding in terms of scheduling and milestones. We were also interested in how this process could be improved, and if there was an example of best practices within the organization. The question regarding awareness of the challenges facing older employees was especially important. At the end of each interview, we gave the interviewees an opportunity to talk about what actions they would take if they were free to do so.

In order to facilitate a deeper understanding of the gained insights and to further refine our actual research design and data-collecting process, we actually started the analysis of our data during the data-gathering period and we tried to deepen our understanding of the specific circumstances by moving from obvious observations and the surface of the problem towards the hidden topics and issues that surround this phenomenon.

Some companies agreed to an interview, although the aging workforce was not yet on their organizational agenda. If our initial question of how this topic was perceived and addressed uncovered that there was no problem or challenge, we – as in the above-mentioned approach – analyzed this response by identifying specific organizational circumstances that could explain this. These interviews turned out to be equally valuable and enlightening to our research as the others, for they allowed us to draw potential conclusions regarding the different issues faced by the different companies. Whatever the case, our visits and appointments included an in-depth observation of the actual production line.

3.4 Data analysis

Our qualitative research design worked very well in this specific environment (Glaser/Strauss 1967; Lee 1999; Stake 1995). Since most of the data sought was qualitative, we used triangulation as one of the most important means of ensuring our findings' soundness (Denzin 1978). Company background information, internal and external documents (press releases, presentation slides, executive speeches and interviews), archival material, detailed interview, and observation protocols were integrated and used in our database. Although, according to Creswell (2002), generalizability and reliability are of less importance for the qualitative researcher, we nonetheless strived to fulfill the highest standards possible in terms of the data quality. Since exploratory studies are not concerned with internal validity, we focused our attention on a concept of analytical generalization by applying multiple sources of evidence, pattern matching,

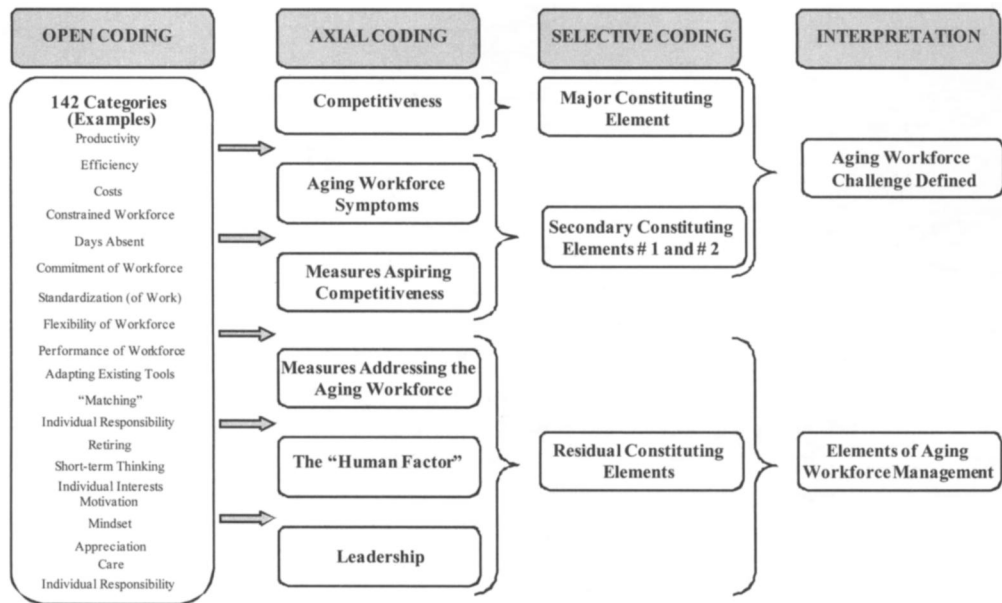
and by addressing potential rival explanations (Yin 2003). Reliability was sought afterwards by strictly following academic transcription and documentation standards when preparing the interview and analysis protocols, through multiple iterations of our analysis, and by cross-analyzing our comparative findings (Creswell/Miller 2000; Lincoln/Gupa 2000). Most importantly, key informants and interviewees reviewed the case study protocol and report, and cross-checked the results of the analysis.

We circumvented the disadvantage of not having taped all interviews by writing detailed reports and analyses of the talk immediately after the conclusion of the interview and by having the interviewees check them where possible. An eventual cross-check of taped and non-taped interviews proved that the quality of both protocols were equally high.

After the data gathering was concluded, we structured and coded the data through cyclic reading (Strauss/Corbin 1990). In accordance with grounded theory research (Glaser/Strauss 1967; Miles/Huberman 1994), we identified where there was a need for action regarding the aging workforce, the perception of the challenge, the operationalization of the main issues, the factors influencing competitiveness, the measures applied, and the strategic orientation of related projects. We analyzed our database in accordance with Miles/Huberman's (1994) understanding of how to deal with qualitative data, as well as Strauss/Corbin's (1994) basic concepts.

As a first step, we proceeded with open coding, generating categories of information, as illustrated in figure 1.

Figure 1: A schematic overview of the conducted coding process

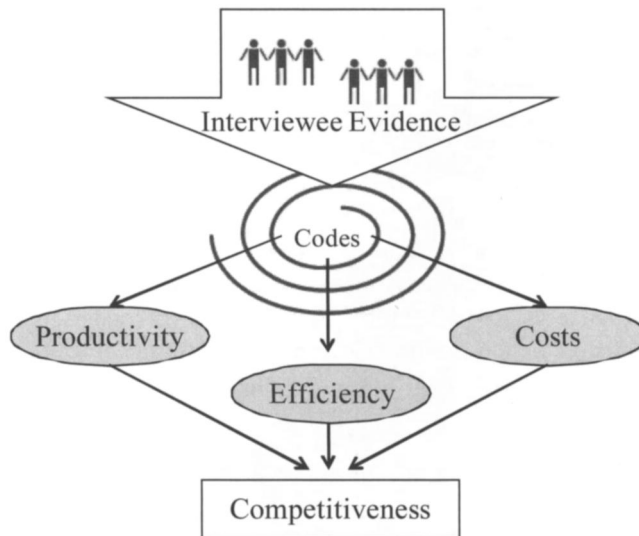


Altogether, the study resulted in 142 categories that provided a comprehensive overview of all related issues and topics in the field. During axial coding, we then grouped

the categories into a smaller number of sets, identifying a dominating constituting element (competitiveness, as well as secondary and residual elements) through selective coding.

Although these analytical steps, which are typical of grounded theory, do not require an exhaustive explanation. Figure 2 illustrates how the authors moved from open coding to axial coding in respect of the competitiveness element:

Figure 2: Schematic coding process for the competitiveness example



Productivity, efficiency and costs are three codes that were constantly repeated during the interviews. They were directly related to a not further defined concept of competitiveness within the specific automobile company's realm. During the analysis, it became apparent that those codes could be subcategorized into the general term competitiveness and that the interviewees' more detailed elaborations on being competitive always related to one or more of these three codes. Therefore, this element also served as an "anchor" to which other categories could be related, as will be described in detail in the following sections. The process was analogous to that of the other codes until they all fitted into a superior category.

It has to be emphasized that the identified dominating element competitiveness only serves as a means to link the other elements to one another and to clarify potential interrelationships. This is a result of the analysis process and not a scope of research that the authors chose voluntarily. This linking is analogous to combining cluster-analytic and factor-analytic methods that are found in more quantitative approaches (Miles/Huberman 1994) with axial coding (Creswell 2002; Strauss/Corbin 1994). It is especially important that this point is highlighted here, since our competitiveness construct is only valid in terms of its defined context. The authors do not know of any exhaustive and general definitions of the term, especially with regard to

aging workforce management; consequently, this represents another important research gap beyond the scope of this contribution.

In summary, we used network schemes and matrix displays for axial and selective coding in order to illustrate hierarchies and relations, as well as dependencies between the coded categories. Once again, we adhered closely to the recommendations made by Miles/Huberman (1994). Figure C.1 illustrates how we applied the coding process in practice, moving from interview data to constituting elements, and then to the subsequent interpretation of our findings. Our results are the outcome of a qualitative and explorative study based on a grounded theory paradigm and analytical methods. Our research strategy ranged from participant observation and semi-structured interviews to the analytical use of print material and background information about the organization.

4. Results and interpretation

In this section, we illustrate the constituting elements identified during our coding process in detail and interpret these findings in the context of our research. We consequently aim to answer the questions: What defines the aging workforce challenge in our research sample? What are the issues with which aging workforce management has to cope? Clarifying these issues will provide researchers with the critical, seminal knowledge required to design prospective research and develop a sound theory of aging workforce management. Exploratory studies, such as the one at hand, are by definition applied in a research context that is not yet explicitly specified and requires data for the formulation of valid hypotheses (Streb 2009). With this attempt at providing an initial overview of potentially relevant variables and their indicated interrelationship, we hope to make a seminal contribution to theory development in the specific field.

As explained above, Figure C.1 displays some of the open codes that we gained directly from a cyclic reading of the archival data and interview protocols. After grouping these codes into appropriate categories, we applied triangulation to identify the major driving element, which is 'competitiveness' (see Figure C.2). It is important to note that this element has not been intentionally placed in the focus of the following results and interpretations, but that our analysis has led to its identification as a main element to which other elements relate – as indicated in the interviews. The prominent position of competitiveness in our theoretical construct is therefore a result of applied grounded theory analytical steps and by no means a scope of observation or of our research.

Our study reveals that a number of measures are applied to produce competitiveness but that these measures might be counteracted by aging workforce symptoms, such as absenteeism. The conflict between measures that try to achieve competitiveness, on the one hand, and issues arising from an older workforce, on the other, is what defines the aging workforce challenge.

Measures applied to address the aging workforce challenge are, however, undermined by what can be categorized as the 'human factor'. As our interviewees indicate, appropriate leadership might solve this conundrum. This interrelation of applied

measures, ‘human factors’, and leadership are the residual constituting elements of aging workforce management as identified in our research.

It is important to stress that these elements, or potential ‘variables’ for subsequent research, as well as their proposed interrelationships are the key contribution of this article to future theory development. In the absence of preliminary propositions and hypotheses, there is a need for proper definitions of elements and for further qualitative and quantitative research into their generalizable interrelations that can subsequently be developed into theory.

In the following, we elucidate the details of these elements and their interrelations through which we propose to expand research.

4.1 The aging workforce challenge defined:

What are its constituting elements?

Our research indicates six discrete constituting elements of the concept of aging workforce management, of which one is a major element, two are secondary elements, and three are residual elements. These are indicated in Figure C.1. These six elements are interrelated and dynamically linked, despite their relative importance. They are only differentiated here for analytical and discussion purposes.

Competitiveness: The major constituting element

Competitiveness as a concept is not easy to define. Moreover, the authors know of no literature that examines competitiveness within the scope of aging workforce management. This is largely due to the fact that, depending on whether one refers to companies, industries or nations as a whole, the term receives its meaning from the context. Comparatively, competitiveness usually refers to participants’ ability and performance in a specific market (Krugman 1995). It can therefore be argued that competitiveness is a concept that has to be defined according to the respective business.

In our context, competitiveness means competing successfully in the market in the present and future in terms of productivity, efficiency, and costs despite an aging workforce. In every interview, we found an indication that the actual fear regarding the workforce’s higher average age is not age itself, nor is it of possibly having to acquire additional measures (training or ergonomic devices). Currently, the single most important issue for any manager in the automobile industry is the increasing global competition and the resultant pressure for higher productivity, efficiency, and lower costs, especially with regard to financial data and key figures. This business is facing an increasingly competitive market, with more competition arising in Asia. The product itself is mature and the price is an important factor, especially in the mass product car sector. Producers and even plants of the same conglomerate are competing against each other in terms of productivity to ensure low production costs. The cost of labor has specifically become an important issue for the European automobile industry. While, for example, Asian producers’ quality standards are increasing, they still produce at lower costs. These factors are causing increased pressure, not only between companies, but also within the same company as it could determine where the next generation models will be produced.

As mentioned before, certain issues linked to the aging workforce, especially in Germany, are thought to affect the key indicators of organizational success via increased cost, thus endangering the organization's competitiveness. We will examine this in more depth, while elucidating the other elements in the next sections.

Measures aspiring competitiveness: Secondary constituting element

Facing the pressure of increased costs and the overall quest for more competitiveness in terms of productivity and efficiency, the management in our sample is employing certain measures to achieve this goal. The most important measure established via the interviews was the increasing standardization of work and processes. This means that the automobile industry in our sample is currently setting more rigorous standards for task performance, especially for those on the production line. Jobs are analyzed in terms of their value creation and streamlined according to the core value-creating tasks. Workers are then trained to perform according to a strictly laid out work design. This includes fixed workstations within which assigned tasks have to be performed on the production line, fixed cycle times for each station, and single-step clocked jobs. The idea is to increase quality by performing easier tasks and to make training of the jobs easier.

This is closely linked to the workers' flexibility. Management requires them to perform different jobs, moving to where they are needed most to create value for the organization. A typical example is the launch of a new product that might require more employees at a specific facility that is facing more demand than at locations with mature products. Flexibility in terms of deployment and more standardized workplaces, with training being facilitated where required, are complementary factors that contribute to the organization's competitiveness.

Finally, management requires the workforce to increase its overall performance. Although standardization and flexibility already make high demands on employees, they are linked to other, preconditioning or resulting issues like decreasing cycle times, increased pressure to learn new tasks and less possibility to work at favorite workstations. The average worker has to perform at a much higher level today than his or her counterpart a few years ago. Regardless of continuously improved ergonomic measures, mental and physical stress levels have increased as well. This is confirmed by all of our interviews. While this can contribute positively to the workforce's competitiveness, it is, however, also negatively linked to the factors and issues that possibly conflict with competitiveness. In the following, we will describe this relationship in more detail.

How these competitiveness issues relate to the aging workforce is described below.

Aging workforce symptoms: Secondary constituting element

Our research indicates that there are certain factors, linked to age, that directly influence the cost of production and therefore productivity. First of all, a workforce with a higher average age leads to a higher percentage of constrained workers, i.e. workers who are no longer able to perform their tasks according to the company's standards. In the automobile industry, this usually means that an increasing number of people,

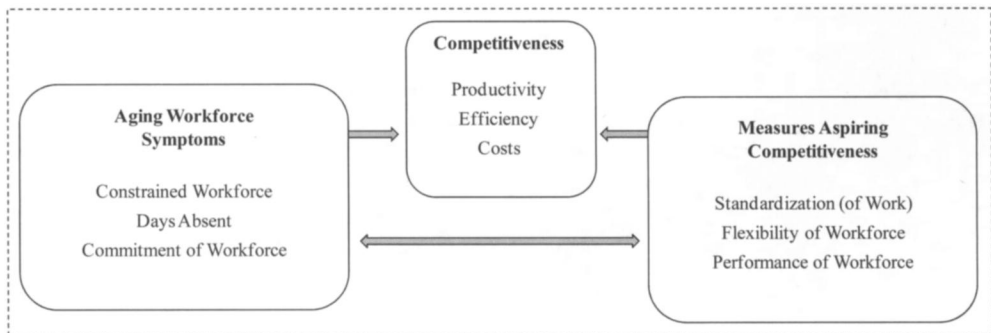
who work in shifts on the production line and perform various degrees of strenuous physical duties, are no longer capable of doing their job or any other value-creating responsibility. In Germany, for example, these workers cannot be laid off, so it is common practice to continue to employ them in easier workstations, like supplies, or in other jobs that are not part of the core business. Since they still receive full pay, these measures create a significant burden in terms of the organizational cost structure.

Another factor is the increase in the number of days absent. There is a well-known and very well researched correlation between age and the number of days workers are absent due to illness. Our research confirms that older employees are not ill more often than younger ones, but when they are, they are absent for much longer.

While these two factors are actually the only ones that can be confirmed through measurements and figures, there is another factor that cannot be proven so easily – individual workers’ commitment to the job and the company. This factor’s affect might, however, impact the overall cost structure to the same degree as the other age-related factors. While smaller, handcrafting companies offer excellent examples of employee commitment, no matter what the ergonomic conditions are, the opposite is true of mass manufacturing companies. There, interviewees across hierarchical levels indicated that there is a lack of employee commitment, which not only affects the number of days absent, but also willingness to be classified as a constrained worker:

If, regardless of the reasons, there is no commitment, the slightest physical disorder is a good enough reason to be absent from work, which is fully paid for a certain number of days. Moreover, workers do not mind being classified as constrained and accepting an easier job. This perception is based on our interviewees’ years of personal experience with these matters. They do, however, also know workers who are indeed committed and, despite their more advanced age, are never absent and do not at all require an easier job.

Figure 3: Major and secondary elements constituting the aging workforce challenge



These factors influence competitiveness directly and interfere with measures aspiring to increase competitiveness. Our research also indicates that the described managerial measures can actually worsen the situation. Standardization, increased demands regarding the workforce’s flexibility and improvement in their overall performance are all aimed at the average healthy and fully capable worker. Limitations in terms of

health, commitment, or age are not generally taken into account, making it even more difficult to employ an older workforce and discouraging them even more. Therefore, there is a contradictory relationship between managerial measures and efforts to achieve competitiveness and the factors and issues linked to age that could conflict with this goal, resulting in a vicious circle.

Figure 3 illustrates the major constituting element and the two secondary constituting elements that define the aging workforce challenge as described above, with their respective variables.

4.2 Aging workforce management: The residual elements

Up to this point, we have described what is considered to be the aging workforce challenge as perceived by the interviewees in our sample. We subsequently discuss the three residual constituting elements of aging workforce management: measures addressing the aging workforce management challenge; the human factor; and leadership.

Measures addressing the aging workforce challenge

In order to deal with the aging workforce, management has begun to implement certain measures. Most common is the adaptation of well-known, existing tools, especially in the field of health management and human resources. These tools range from information and communication about health to more concrete issues like the introduction of health and fitness clubs at plants, regular flu shots, and general examinations, to mainly ergonomic measures on the production lines. Adapted recruiting, if possible, career development, as well as succession planning are more examples.

Another measure is the matching of workstations and employees. This is a process in which all available workstations, for example, on a plant's production lines, are analyzed and categorized according to the specific physical exertion and training that they require. The available workforce is then analyzed in respect to their physical and training status. Ideally, job requirements and individual abilities are matched and a suitable worker, who can perform within the set standards, is assigned to a compatible position on the production line. Apart from the many issues that this approach raises, such as concerns about data security (mentioned the union committee), it is not a new measure. It might, moreover, not even prove to be helpful if the available workforce is no longer quantitatively sufficient to meet the workstation requirements due to an increase in constrained workers and there are cost restrictions on hiring. In theory, however, this could be a chance to assign even constrained workers to value-creating positions.

Another possibility is, of course, to simply release the redundant older workforce and hire new people to fill the vacancies. In many interviews, it was mentioned that due to increased productivity and/or decreased demand for certain products, a general personnel surplus has been building up. Retiring that part of the workforce that is already considered constrained would, according to the interviewees, not only reduce overcapacity costs, but would also decrease problems with constrained workers. Our research shows that within our interviewee sample, this is definitely considered a valid tool by management for dealing with the demographic challenge, and possible nega-

tive side effects, like age discrimination, legal issues or the loss of valuable knowledge and experience, are usually entirely ignored. Finally, management also tries to appeal to the workforce's self-responsibly as far as their health, commitment to the job and organization, and keeping their capabilities up to date is concerned.

The human factor

We next examine the subtler and subconscious areas of the soft factors related to the aging workforce. According to our interview sample, they, too, can negatively influence the successful implementation of measures to increase the aging workforce's productivity.

Most significant of these soft factors is the short-term thinking of many responsible managers. Most interviewees emphasized that cost pressures meant that the applied measures' long-term perspective, success, and sustainability were neglected. Managers are eager to perform well in terms of short-term key financial figures and try to avoid costs and investments that will not pay off in the short run. However, investments in human resources are usually long range, costly, risky, and might not pay off for years. Most corrective measures are short-term, simple, and non-risky tools that are easy to check off on the managerial agenda before returning to the day-to-day business.

In our interviews, we were confronted with managers and the workforce's individual interests. While management is interested in short-term success, the workforce strives to improve their work situation. They furthermore regard self-responsibility in respect of their health and commitment a private matter. Moreover, trying to avoid tougher work conditions is common, regardless of age. Other human factors include motivation in general and employees' mindset, especially regarding commitment. As some interviewees pointed out, the increased need for competitiveness is contrary to what the workforce has been accustomed to, especially in western industrialized countries with an incumbent automobile industry. When the older workers were hired, work design was more oriented towards the philosophy of teamwork and job enrichment. Standardization follows an opposite paradigm. Lay offs and early retirement have also effected the overall motivation to perform beyond the basic requirements and have created a self-focused mindset in younger workers as well.

It is, however, important to once again point out that all these issues resulted from the research within our sample. The human factors mentioned above are specifically still a conundrum and contribute greatly to the underlying insecurity associated with them in the automobile industry. These factors should in fact make management aware that the challenge of aging workforce management cannot be mastered by simply adjusting the already existing toolbox with its focus on the obvious.

Leadership

When analyzing aging workforce management at this level, the most important question is: what can responsible and sustainable management do to correct the possible negative influence of human factors and to allow suitable measures to be successfully implemented?

As mentioned before, the human factor is a conundrum. Many interviewees highlighted the importance of appropriate leadership, close to the workforce, to understand their issues and to find appropriate measures that are mutually beneficial. However, we are not sure whether this is an actual solution or whether it is just the only solution available. The most significant issues regarding the human factors mentioned during the interviews were appreciation, care, and self-responsibility. Consequently, leadership should appreciate the workers' needs, concerns and problems, while simultaneously keeping the organizational goals in mind. The leadership therefore has to steer a course between creating the necessary motivation and commitment, and stimulating awareness of self-responsibility.

Leadership can influence the impact of human factors on managerial measures aimed at the aging workforce. However, we also found that managerial measures can also have a negative influence if they ignore the human factor.

From the description of our research findings above, it is clear that the identified categories are to a certain extent sequential: After the identification of the aging workforce challenge, certain measures try to address the related issues while potentially being counteracted by human factors, which appropriate leadership is supposed to mitigate.

In the next section, we provide recommendations of how the actual interrelations between these factors should be researched in future.

5. Implications for further research

The research presented in this paper was aimed at identifying the constituting elements of aging workforce management to construct an essential understanding of the concept in the automobile industry. As the demographic impact on organizations, especially in industries where physical labor is predominant, is still underrepresented in academic research, we applied grounded theory, which is very suitable for this kind of research setting. Based on participant observations, as well as archival data and interviews, and after a process of coding, we identified constituting elements that answer the question of what the aging workforce challenge is and what other important issues are that management has to face.

The results suggest that the automobile industry's actual focus with regard to this topic is on its overall competitiveness in the global market and that preliminary measures are aimed at improving competitiveness. However, as described, the aging workforce might be a barrier to this goal. Therefore, in our research context, this challenge could be defined as organizations' on-going quest for competitiveness in a global business environment despite the possible negative impact of an older workforce.

Although, aging workforce management is primarily aimed at correcting the most obvious effects, especially on a physical dimension, our research does prove that this is not enough to understand and successfully manage the problem in organizations. Underneath the most obvious issues, there are human factors that do not necessarily have anything to do with age and that will make it very difficult to fully understand how organizations can be sustainably managed and provide benefits for all stakeholders under these circumstances. As described, our interviewees recommended appropriate leadership to correct human factors.

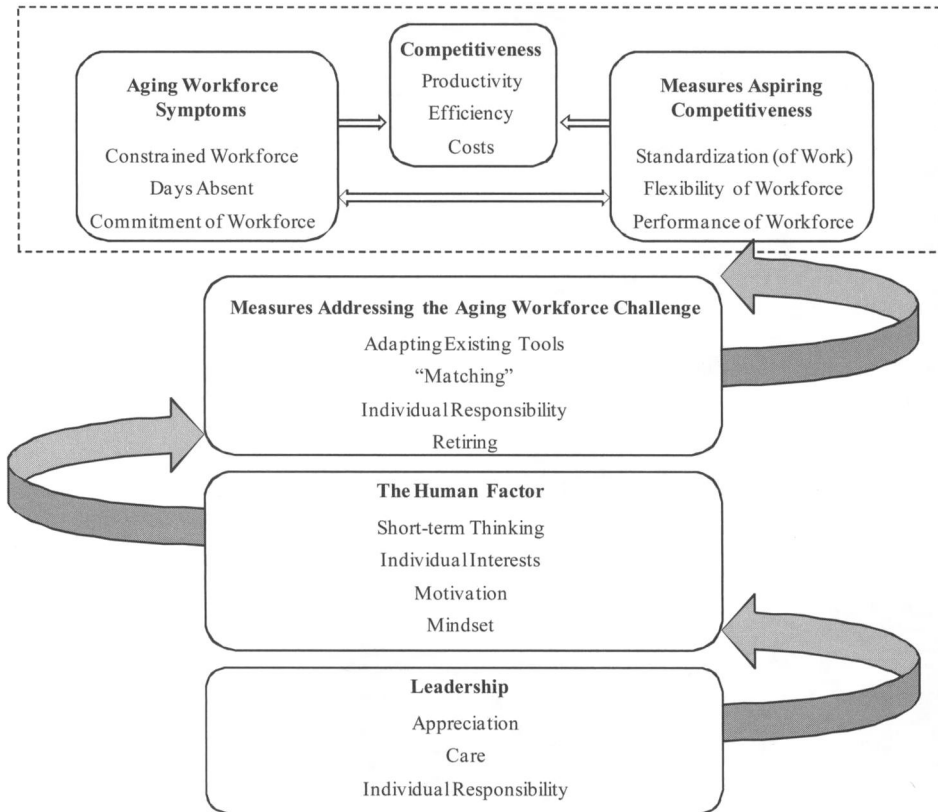
Furthermore, the actual challenge and the essential constituting elements consist of issues that are common to any organization's management agenda. It is therefore a misconception that the aging workforce provides management with a totally new problem, and that, subsequently, a totally new organizational toolset is required. The residual elements are also very familiar to any organization facing similar problems.

Our research approach and methodology had both advantages and limitations. As already emphasized in the methodology section, grounded theory is very appropriate when it comes to research topics that still require much basic work. Our research follows seminal works on how to apply grounded theory, and draws valuable data from a number of sources. We do, however, also face one major limitation in that, as we pointed out, the aging workforce affects organizations individually and they thus require individual solutions. The results presented here may be valid for the companies constituting our sample, but they are certainly not generalizable across organizations. In order to overcome this limitation, it is our intention to apply these results in further studies encompassing other industries as well.

Our contribution with this work is thus aimed at a clearer understanding of the actual challenge – thanks to an exploratory first definition in the field – and suggestion where possible future research can be applied in respect of theory development. While we are not bold enough to propose an actual theory of aging workforce management, we do, however, provide a framework that can guide subsequent studies. Good theory would require clear and explicit predictions that can be tested and, thus, verified or falsified. Furthermore, a theory should be based on multiple sources of evidence and either support or disprove preceding knowledge (see Streb 2009). In a field of research which is lacking preliminary hypotheses and prepositions, such as aging workforce management, a conceptual framework, such as the one suggested in figure 4, provides the essentials to formulate preliminary theory and test it. This figure, which the authors propose as a guideline for further research efforts, graphically summarizes important propositions. We present the aging workforce challenge “on top” – as described in detail in the previous sections. Below, the reader finds the residual elements in progressive order, with the arrows indicating potential interdependencies, for example, the potential effect of appropriate leadership on the human factor, as was described above. Our interviews provided some evidence that, starting with the actual challenge, the residual elements are interrelated with one another in the presented, interdependent way.

Future research will have to address important questions with regard to cause and effect, interactions between elements, and measures to actually change mindsets and apply appropriate leadership. Specific questions should address the link between a workforce's actual age, organizational performance, and its operationalization, as well as addressing how human factors influence the implementation of related measures. Moreover, clarification is required regarding the way in which aging workforce management differs from any other management process needs, as well as, most importantly, the kind of leadership that is required in practice. In general, the interrelationships as well as the effects between the identified constituting elements have to be analyzed in further detail. Specifically, theory development needs to formulate strong hypotheses, based on our conceptual framework, on the proposed definition of the

Figure 4: A conceptual framework of the interrelated elements apparent in the management of the aging workforce in the automobile industry



aging workforce challenge and on the potential and hypothetical interrelationships of residual elements. In accordance with sound theory development, these hypotheses need to form the research aim of focused, potentially more quantitative, studies that can verify or falsify our framework, drawing from multiple data sources and eventually lead to the formulation of accurate theory (Streb 2009).

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