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### **Requirement profile 4.0 – How does the forth industrial revolution affects the requirements profile of executives?**

In 2011 the German Government presented the project “Industrie 4.0” that should revolutionize the German economy and increase production and efficiency in a wide range of industrial sectors with its High-Tec-Strategy. The core idea is to develop a dynamic product that is capable to move entirely independent through the production process and possesses all required information. This includes all details about the manufacturing process like completed and pending production steps as well as all required configurations. Furthermore this dynamic product should be able to change its own processes and the complete production process autonomously. Due to this radical change of the production process with more intelligent technologies a profound change of the working environment will also occur. Manufacturing processes in Smart Factories will change themselves to autonomous processes. Thus, workforce will be only needed for monitoring and controlling the processes by usage of a virtual production. Simultaneously research and development will be developed more systematically. These fundamental changes of the working environment and of the social structures pose a challenge especially for executives of German industrial companies. Admittedly, particularly managers in the technical area have to catch up and are not yet meeting the challenge of Industrie 4.0. This leads finally to the research question: How does the fourth industrial revolution affect the requirement profile of executives?

Because the perfect manager does not exist, personal management assists itself with a requirement profile. This profile contains the four areas professional, methodological, social and personal competence and tries to come as close as possible to the ideal profile. Whereas professional competence describes the educational background and professional experience, methodological competence is responsible for the executive’s ability to develop his professional competence and to implement it. This contains skills in controlling, change management, time management, learning ability and problem solving capabilities. Social competences are needed to assert methodological expertise against employees and to understand and influence their performance. This includes skills like interaction, communication, the ability to handle conflicts, the ability to delegate, engagement and representation abilities. Personal competencies describe character abilities and attributes of an executive that are crucial for the contact with employees, colleagues and superiors. This incorporates awareness for values, encouragement, objectivity, self-control, authority, idea of man and stress resistance.

For the implementation of Industrie 4.0 a series of challenges have to be coped with and these lead directly to certain requirements of executives: The development of key technologies depicts for managers of German industrial companies to ensure an acceleration of the knowledge transfer from universities to corporations. Additionally, the acceptance of the integration of Industrie 4.0 to small and medium-sized enterprises (SMEs) driven by the executives will be a challenge. Furthermore, the different working environment requires an adjustment of behavior and attitude of the employees as well. Thus, a high degree of social competency of managers to ensure the integration of their staff into the process and to enforce the progress is mandatory. The subject of standardization will specially lead to changes for executives because they have to define the standards and therefore need to subordinate competitiveness between different companies. Moreover, executives have to cope with data security and the legal framework because they are going to be responsible for finding



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the demanded regulations and to implement them. Because people must be the driving force of the key technologies development, training and coaching are vital. As a consequence executives must take this challenge and change from a sole company leader to a coach of the employees.

Executives of the management board of mechanical, plant and electrical engineering companies with direct references to Industrie 4.0 were interviewed with a questionnaire. The first part covers the aspects of Industrie 4.0 that have currently to be dealt with. In the second part, these experts are asked to provide an evaluation of leadership elements and part three examines specific requirements for executives in the era of Industrie 4.0.

The results of the expert interviews show that data security next to training and coaching are seen as the most relevant challenges of Industrie 4.0. These are followed by the development of key technologies, the increased social competency and disruptive leadership. The findings also depict with regards to leadership the elements flexibility and agility as crucial. With regards to the determined three dimensions of leadership – managing skills of a company, leadership skills of people and leadership skills of oneself – all experts agree that leading people and self-leadership are the most important dimensions. It was also agreed on the fact that employees have to be more integrated into the development process to change their own role from affected persons to participants. The current working time models are also seen from a critical perspective; especially the international comparison illustrates that a 24/7 model per week cannot be avoided on a permanent base. Finally all experts see a new understanding of leadership as essential.

In total the promotion program Industrie 4.0 has in connection with the development of society lead to different understanding of leadership. Unfortunately, with the current results creating a generic adjustable ideal profile that modularly pictures all potential requirements of executives and that can be customized to specific positions and companies will not be possible. However, a general requirements profile for the modern executive in the era of Industrie 4.0 can be presented:



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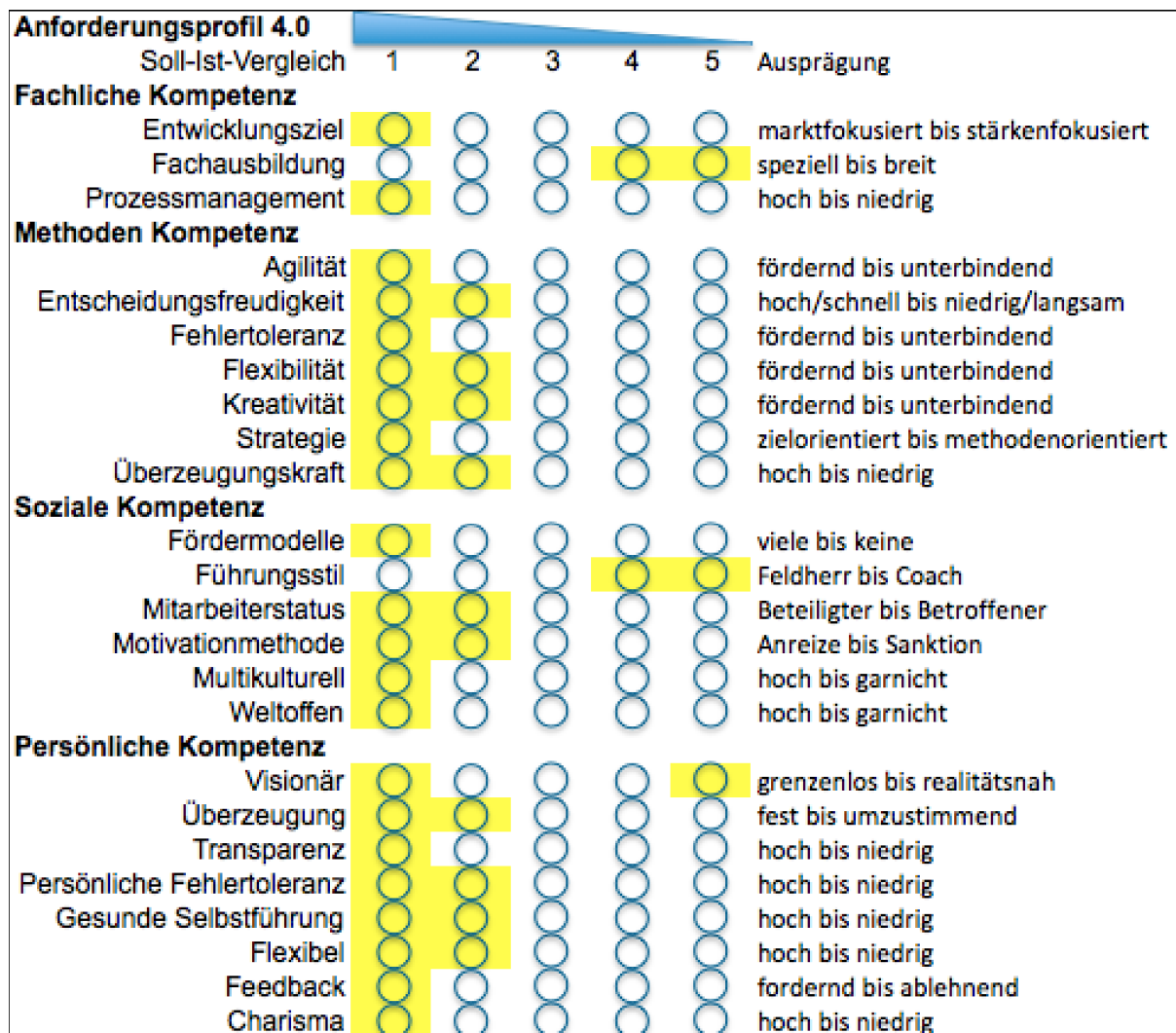


Figure 1: Requirement profile 4.0

The surveys illustrated that the German industry requires especially with regards to the integration of Industrie 4.0 a new comprehension of leadership and that the significance of true leaders will further increase in the future. In particular the integration of Industrie 4.0 into the enterprises cannot be achieved without executives being the link to the employees. In the future employees need less to be managed and more to be lead as well as executives must manage themselves. Moreover managers have to be more transparent compared to the past. They have to show more fault tolerance and need flexibility, creativity, visions, charisma and persuasiveness. In addition they have to act in a more strategic and decisive way. In summary, the role of an executive will increasingly change from a commander into a coach.