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**DIGITAL OCCUPATIONAL HEALTH: DIMENSIONS AND STRATEGIES
FOR SUSTAINING HUMAN RESOURCES**

Working conditions are changing due to digital innovations. From a sociotechnical systems perspective technical, organizational and social changes must be considered [5]. In order to differentiate more clearly between individual changes and systemic adaptations, innovations can take place on the micro, meso, or macro levels [1, 4]. Changes at the micro level depend on changes at the meso level changes, which in turn depend on changes at the macro level. When considering the influence of artificial intelligence (AI) on occupational health, changes occur on all three levels. The following illustrates the micro, meso, and macro levels and their dependencies to emphasize the need for them to be developed together to secure digital occupational health.

Digital Leadership

Since Fritz Giese (1927), interventions have been categorized as either subject or object psychotechnics. Object psychotechnics (as a meso level) are preferable for leadership applications and are discussed in more detail in the next section. Subject psychotechnics (at the micro level) concerns the adaptability and development of the workforce competence. Digital requirements are diverse and demand new skills such AI literacy and critical thinking. Proactive leader-follower support can improve workflows and facilitate the establishment of suitable digital processes. Productivity-enhancing technical innovations can temporarily support the leader-follower relationship. Together with competence development and individual empowerment, this can be applied to increase work satisfaction. Routine tasks are increasingly being transferred to AI agents, resulting in a shift in the main work responsibilities. Coordination, control, and innovation are growing in importance, which are typical leadership activities. Heterogeneous interpersonal and diverse persona to digital organization relationships will become more prevalent in daily work. Good digital practices and successful human-computer interaction coping strategies will therefore become prerequisites for healthy

working conditions. Thus, leadership is becoming more demanding and needs to develop new solutions to sustain occupational health, for example in home office situations or when teaming with AI agents. Technical supervision, supporting participation, and enabling control will play an increasingly important part of motivating holistic leadership. Therefore, digital leadership provides clear opportunities but also requires strong technical as well as social competencies. The central challenge of digital leadership at the micro level is maintaining or increasing work motivation and satisfaction – key indicators for sociopsychological occupational health – but this clearly requires support from the virtual organization at the meso level.

Virtual Organization

Satisfying and motivating work goes hand in hand with supportive working conditions and environments. Real changes to working conditions are primarily achieved through object psychotechnics. Supporting structures and processes form the basis for good and healthy work. Without the right conditions and environments, even the greatest effort at a micro level is destined to fail. The digitalization of processes together with the support of AI agents provides a promising opportunity for positive structural change. Digital work systems can be defined as a virtual organizations, in which the individual worker is part of the technical organization, rather than simply interacting with it. Within this digital structure, routines are increasingly outsourced to the virtual organization. However, these routines must be established, controlled, and optimized jointly by human and digital resources. As well as increasing efficiency, the organizational goal must be to improve working conditions so that they are stimulating yet not too demanding. Supportive and enforcing virtual organizations at the meso level must be embedded within a human culture at the macro level.

Human AI

The current discussion on AI lacks a value system that supports and regulates AI practices in a way that is both socially convincing and legally binding. According to human AI [3, 6], intelligence is a collaborative process that augments human intelligence. This emphasizes the supportive role of AI, which is in line with the historical integrations of technical improvements in the production process. The human AI paradigm includes standards such as transparency, accuracy, and usability. These standards provide a supportive digital occupational health

framework at a macro level. Global ethical values and guidelines can be developed globally and refined regionally to empower human decision-making at the meso and micro levels.

Implications and Outlook

Innovations in working conditions clearly depend on the behavioral environment. Successful adaptations on the micro level to sustain occupational health (e.g. digital leadership), depend on innovations at a meso level (e.g. virtual organization) and conditions at a macro level (e.g. human AI). It is only through their coordinated development that sustainable growth in human resources can be achieved. Here only a small part of the overall picture is spotted. The various political, social, legal, and economic issues of AI development need to be understood and successfully integrated. Interdisciplinary sound solutions at the micro level go together with successful organizations at the meso level in tackling the global challenge of sustaining digital occupational health at the macro level.

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