New disparities in the digital transformation of work manifesting in structural violence

With considerations by the example of gender

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Abstract

The digital transformation is affecting all areas of life, including work life. In its wake, new disparities arise, some labelled with key words such as digital divide, digital gender gap, digital stress and intersectional marginalisation. In this article, implications by the example of gender-related disparities are considered. With the increase of digital technology, new stressors arise for users in many vocations. The new disparities also involve impeded entrance of women into, and sojourning in, the growing digital sector of the labour market, and intersectional issues can charge the situation further. From a psychological-interdisciplinary viewpoint, overall developments in the digital transformation of work, manifesting as a pattern of structural violence, are discussed.

Keywords: digital transformation of work, gender, new disparities and vulnerabilities, structural violence

Zusammenfassung

Die digitale Transformation durchdringt alle gesellschaftlichen Sphären inklusive der Arbeitswelt. Damit scheinen neue Ungleichheiten auf, die mit Begriffen wie digitale Spaltung, digitaler Gender-Gap, digitaler Stress und intersektionale Marginalisierung umschrieben sind. Im folgenden Beitrag werden exemplarisch geschlechtsbezogene Ungleichheiten beleuchtet. Einerseits gehen mit zunehmend digitalisierter Arbeit neue Stressoren für Anwender*innen in vielen Berufen einher. Andererseits finden Frauen erschwerte Zugangs- und Verweilbedingungen im wachsenden digitalen Arbeitssektor selbst vor, wobei intersektionale Verschränkungen die Probleme verschärfen können. Aus psychologisch-interdisziplinärer Perspektive werden aktuelle Entwicklungen in der digitalen Transformation von Arbeit diskutiert, die sich als strukturelle Gewalt manifestieren.

Schlagwörter: digitale Transformation der Arbeit, Geschlecht, neue Ungleichheiten und Vulnerabilität, strukturelle Gewalt

1. Violent-free work versus an aggressive mode of acceleration

The International Labour Organization pursues with its Convention 190 the goal of *violent-free work as work of the future*. The labour market is currently not only driven by global marketisation but also by the digital transformation of work and by demographic changes. Arising questions

concern new inequalities and vulnerabilities emerging in this context, discussed in this article with respect to their structural consequences and from a psychological and interdisciplinary angle, by example of the dimension of gender.

Politically, gender equality is considered by the United Nations (2024) as an elemental factor for a sustainable development, and it is a central prerequisite for the achievement of global sustainability objectives in the UN's Agenda 2030. There, gender equality is a cross-sectional topic in all sustainability goals (SDGs) *and* the stand-alone goal SDG 5. Furthermore, by implementing the EU's Council Directive 2000/78/EC, the majority of the EU-states included provisions against gender-based discrimination into their law. In Germany, this is part of the Anti-Discrimination Act[1], applicable at the workplace.

From a *psychological* and sociological perspective, impacts of the digital transformation of work will be discussed in this article, which also emphasises the intersectionality of issues, by the example of the dimension of gender. Evidence will be presented that the digital transformation of work heightens disparities and vulnerabilities particularly for women. When these issues do manifest structurally, they can lead to structural violence. When violence at the workplace is issued, also indirectly effective factors and psychological strains need to be considered.

Economic growth is a main promoter of progress and prosperity, leading to increasing acceleration of technological, societal and work-related processes. Since the launch of the Internet in 1981, this development gained specific momentum. The sociologists Hollstein and Rosa (2020: 24f.) describe a *mode of aggression* as part of the societal logic of growth, coining its processes fundamentally:[2]

> "Our diagnosis is that the ongoing [...] compulsion for growth, acceleration and innovation produces a societal reality which is marked by a specific mode of aggression and accompanying phenomenon known as crisis on all levels. [...] On the individual micro level, this mode of aggression is expressed in an ongoing compulsion for physical, mental, social and psychological self-optimisation with a tendency to outer aggression. This seems to lead to a higher burnout rate, stress-related illnesses and, overall, an increase of cultural 'sensibility of exhaustion'.

1 In German/references: Bundesministerium der Justiz (2022): Allgemeines Gleichbehandlungsgesetz.

2 The author accounts for all translations from German to English in this article.

> We conclude that the dominant acceleration-based world relationship of post-modernity produces, on the one hand, burnout on the micro level and, on the other hand, a heating up (burn up) on the climatic macro level."

Psychologically speaking, the demands and inherent values of such a mode cannot remain external, they are *internalised* by the individual as an attitude at work and in other areas of life. Many stress responses – for example to the inside as depression, to the outside as violence – can be understood in this context of grounds and reasons. The digital transformation is currently a main promoter of further delimitation and subjectification of work (Pongratz/Voss 2003; Meyerhuber 2021) in many occupations. The question is how such developments relate to the goal of violent-free work as work of the future, as laid out in the ILO Convention 190.

Social sustainability as a goal of the United Nations, violent-free work as a goal of the ILO-Convention 190, equality as a goal of the European Union and its member states – these goals clash with the aggressive mode of acceleration in the wake of the digital transformation and its accompanying effects in the context of work and beyond. In the following section, first concepts for a psychological understanding are introduced: structural violence as hindrance of the development of one's potential, psychological basic human needs and their fulfilment in the context of work, relations between power and health, and new digital stressors in the context of work. Afterwards, an introduction of the issues of digital divides, intersectionality and digital gender gap is given, the latter with regard to new disparities, condensing into structural violence against women at the workplace. A heightened vulnerability of women working via home office is issued in light of rising figures of domestic violence. Also with regard to the access to digital means, and in light of new, AI-based and often biased digital tools in the personnel management, possible gender-related affronts are issued. In the third section, some main solutions are highlighted, and finally some conclusions are drawn. From a psychological viewpoint, the developments manifest as a pattern of structural violence against women.

It should be noted that in this article psychologically fundamental aspects of developments in the digitalisation of work will be discussed with regard to women and by example of work beyond the industrial – the analysis fits foremost for office and remote labour in ICT-related jobs and for desk-work with digital applications, relevant for about 50 percent of the workforce (Eurostat 2020; Eilers et al. 2021).

2. Basic concepts from a psychological viewpoint

The psychology of work and organisations asks how structures of work must be shaped so that human beings can partake optimally and unfold their potential for their own satisfaction and the good of the organisation. In this light, some basic concepts for the discussion are introduced.

2.1 Structural violence as a mental figure for psychological analysis

In order to discuss changes regarding structures of work and their health-related effects on people, the term "structural violence" is suggested as an analytical magnifier. The term was coined by the peace researcher Galtung (1971: 168): "Structural violence is the avoidable impairment of basic human needs or, more generally speaking, of life, which decreases the real grade of satisfaction of needs under the potentially possible." This definition supports a psychological angle, since psychology is bound by an ethical code of conduct to support people's health and wellbeing (BDP 2005).

Based on Galtung's definition, it can be asked: How can all groups of employees satisfy their basic human needs in digitally organised work? Under which circumstances does the digitisation of work improve the potential for satisfying basic human needs, and when can reducing effects be expected? While ICT[3]-professionals will find affirmation in their work-related identity, employees of other vocations might struggle with the growing and ever-changing digital requirements at their workplace, situated further away from their occupational core identity and therefore precipitating alienating effects (Rosa 2013). For the latter, this can result in a *psychological vulnerability in the wake of the digitalisation* of work.

2.2 Psychological human needs in the context of work

From a psychological perspective, work structures and interactions which contribute too much to the negation of psychological human needs and hinder their fulfilment are potentially threatening for an individual's health and wellbeing. Following psychologists Leithäuser and Volmerg (1988: 65ff.), subjective experiences of work can be understood as unconsciously

3 ICT means information and communication technology.

processed on the background of an individual's psychological needs. With reference to psychoanalytical theory, a basic psychological need for control and creativity, a need for acknowledgement and affection and a need for self-esteem and demarcation can be distinguished. In the context of work, a relevant question arises: what contributes positively to the sense of identity, and what threatens the sense of a person's identity?

Empirical findings by social psychologist Jahoda et al. (1933) validate that psychological needs in the context of work are connected to five distinct areas of experience, named "objective experience categories", regarding work-related activity, time structure, social connectedness and participation, identity and status, and collective productivity. Both their presence and absence have verifiably psychological effects on people (Jahoda 1983: 4). Digitally organised work, particularly accompanied by delimited forms of work, *changes in subtle ways the psychologically meaningful fabric utilised by employees.*

Analysis of *latent deprivation* from the five objective experience areas shows that deprivation can heighten psychological instability and depression (Paul/Batinic 2010; Selenko et al. 2011). Since digital technology makes it possible to work time- and place-independently, Meyerhuber (2021: 141–150) analysed by example of long-term home office if the objective categories of experience can be satisfied in remote work, revealing that options become more limited in remote work. Besides, the overall increase of screen time limits human encounters also in the on-site office. In this respect, a *new and rarely discussed vulnerability for employees accompanying digitalised work arrangements* becomes apparent.

With experience, external structures of work become inscribed into the human psyche and its inner structuralisation (Leithäuser/Volmerg 1988). An individual's experience of work can be understood in more depth by acknowledging that a person is linked intimately to their work by feelings, thoughts, goals, wishes, anxieties and limitations. Analytically, people's experiences and actions are to be differentiated from the conditions and structures of work. However, structures and conditions precede possibilities of experience insofar that the aforementioned psychological needs are more likely to be offended under restrictive work conditions, while they are more likely satisfied under a broader creative scope (Leithäuser/Volmerg 1988). Interestingly, under delimited and subjectified working conditions the potential for offence grows again (Meyerhuber 2009: 106-114). For some, *flexible and remote work-arrangements by digital means could become a new source of vulnerability.*

Furthermore, employees working via home office find it harder to separate work and private life, and they tend to work longer (BAuA[4] 2020). The Scientific Research Services of the German Parliament[5] (2009) points out that longer screen time heightens the danger of addiction.[6] Mutually reinforcing effects of work addiction and computer addiction shall not be overlooked: using computers both for work and recreationally accumulates to a high total of screen time (Meyerhuber 2021: 104-106). *In this, a further vulnerability becomes apparent.*

2.3 Power and health

Discourses about health are always also *power* discourses (Schmidt/Schmidt-Semisch 2020: 2). In light of the connection between work, health and the digital transformation it can be asked why certain topics are rarely publicly discussed. A peculiarly on-sided positivity about digital developments can be observed. Even when – as recently regarding chatGPT – some uneasiness is expressed, also an *inevitability* of the development is stressed. The issue of *power* could explain why foremost positive connotations about the digital transformation seem predominant, why connections between work addiction and computer addiction are not issued and why increasing health-impairments related to one-sided work at a screen are no more widely issued (Badura et al. 2019). How to *make sure that occupational health protection standards are observed beyond the company premises* is a recent issue of rumination for the Federal Agency for Industrial Health and Safety (Beermann et al. 2020).

Digitalisation stands for accelerated and accelerating processes of development in all areas of life (Rosa 2005). This is the opposite of gradual human development in the cyclic biological rhythms of tension and relaxation (Fuchs 2020: 296ff.). Psychiatrist Fuchs sees therein a main reason for the increase of psychological illnesses, particularly depression:

4 In German/references: BAuA Bundesamt für Arbeitsschutz und Arbeitsmedizin.
5 In German/references: Wissenschaftliche Dienste des Deutschen Bundestages.
6 Substance-free addictions relate to excessive behaviour and urges (for example workaholism, computer-addiction). In the brain, satisfaction creates similar reward effects (dopamine) as when a substance-based drug is taken. In 2018, the World Health Organization (WHO) included computer-gaming addiction in the clinical-diagnostic catalogue ICD-11.

> "In depression, an increase of the strain on the individual due to an accelerated passage of time becomes manifest. [...] Those illnesses are characterised by a spiral of increased demands on the self and psychophysical exhaustion. First, a rise of work time or intensity can often be found with the goal to meet increasing demands and to avoid social decline [...] resulting in the loss of a daily structure and natural rhythmic of overspending and relaxation. Ongoing strain and growing inefficiency despite increased effort of will is followed by discontentment and frustration, inner emptiness and invalidation, up to psychological decompensation" (Fuchs 2020: 311).

In light of the logic of acceleration in all areas of life, Fuchs (2020: 315) understands depression as a zeitgeisty adaptation disorder because cyclic and linear time appears increasingly in opposite to each other. This can be understood as another facet of the structural violence, since the dynamic seems inescapable for many; work is existential for most people's livelihood. Organisations need to address this issue since labour shortage reaches all sectors (Ministry for Economy and Climate[7] 2024), and in Germany already every second chooses early retirement due to health issues (Keck/Brussig 2023). The goal of violent-free work points to the *necessity to shape work according to human needs*, rather than the other way around.

The World Health Organization (WHO 1986: 2) states in its Ottawa-Charta for Health Promotion that people can unfold their health potential only when they can influence the factors which have an impact on their health, also with respect to their work. Furthermore, the health of employees is related to intersectional dimensions such as gender, age, social milieu, culture and living habits. That together makes participatory processes in times of organisational change psychologically so important. Within organisations, IT experts are given responsibility for internal digital developments. Still, the power of definition and decision in this regard should be distributed by *participatory means* and linked to the goal of disparity reduction.

7 In German/references: Bundesministerium für Wirtschaft und Klimaschutz.

2.4 Digital stress

Working with digital tools implies an increasing need to become a proficient user. Psychologist Brod (1982) introduced the term "techno stress" to describe adaptation issues of the individual to new technology. While an overall positive view of digital progress is predominant, also detrimental effects on people can be observed – what one person experiences as motivating another finds burdensome. The German Federal Ministry for Labour and Social Affairs[8] (2016) found that 78 percent of employees see a need for continual advancement due to tech-developments, and about two-thirds of them describe an expending scope of tasks in this respect.

Gimpel et al. (2018: 13) condensed existing findings about techno stress and built on these in exploration of which factors add to employee's experience of digital stress. In their study, they found already 12 digital stressors and conclude:

> "Digital stress [...] goes hand-in-hand with a clear increase of health impairment. [...] Digital stress reduces occupational performance. [It] coincides with strong conflicts between work life and private life. [...] The grade of digitalisation of one's work is not alone decisive for the level of digital stress. [It] can be found in all branches and fields of activity. [...] Women work at more digitalised workplaces [...] and have a higher level of digital stress than men. [...] Surprisingly, digital stress is more pronounced in the age groups from 25 to 34. And: insecurity while dealing with digital technologies is seen as the biggest stressor, followed by unreliability, flooding, uncertainty, complexity and [...] omnipresence" (Gimpel et al. 2018: 5–6.).

The quotation indicates gender- (and age-)related differences. The data is from before the SARS-CoV-2 pandemic, when long-term home office (Meyerhuber 2021) on a hitherto unprecedented scale took place and issues such as procurement, compatibility, implementation and reachability of a user's helpdesk reached a new urgency. Accordingly, a *further accumulation of digital stressors should be observed* critically.

Furthermore, Gimpel et al. (2020: 6) found three typical digital stress increasing factors: the behaviour of direct superiors, work intensity and the experienced creative scope. These factors indicate chances to alleviate digital stress: Psychological research highlights that, especially under stress,

8 In German/references: Bundesministerium für Arbeit und Soziales.

behaviour of direct superiors can be the decisive factor – social back-up provides psychological stability, while a lack of the superior's support tips burden into overload (Oetting 2008: 53). Additionally, superiors can influence *work intensity* and an employee's *scope for action*, thereby enabling relief of strain. When not mitigated, there are long-term effects described by Gimpel et al. (2020: 6f.) as "reduced productivity, industrial unrest, diminished identification with the employer, less job attachment, emotional irritation, health issues and emotional exhaustion." Organisational actors need to realise possible digital stressors and ease their effects. Some of the stressors are *inevitable* and can add to the pattern of structural violence. Overall, the proposition of new vulnerabilities in digital mitigated work finds additional confirmation.

3. Digital divides and the digital gender gap in the transformation of work

In the wake of the digital transformation, new disparities and vulnerabilities occur. The so-called *digital divide* as an overall term describes the unequal access of groups of people to digital means, standing against digital inclusion, participation and skills. The political scientist Norbert Kersting (2021: 1) defines digital divide as "the unequal individual and group-specific access chances to digital information and communication technology." He points out that such disparities can be found by comparing groups of citizens such as young people and seniors, men and women, marginalised poor groups, groups with migration background and/or people with handicaps, with regard to criteria such as connectivity and digital literacy. Therefore, an *intersectional perspective* is vital for the discussion of impacts of the digital transformation at the workplace; since access to active and beneficial participation in digital developments is allocated unequally, increasing inequalities are already in place (Norbert Kersting 2021: 1).

For decades already, the European Union promotes goals of equal opportunities regarding all people in the EU, but, evaluating outcomes of these efforts, the European Commission (2022) describes a lack of success with respect to gender equality. In conclusion, the political will to reduce inequality is not overall met by societal and labour market practices. *Corresponding issues are currently rather revitalised in the digital transformation*; therefore, the example of *gender equality* in the context of digitalised work shall be discussed further.

3.1 Digital gender gap, inequality and violence

The digital transformation is one of the most fundamental directions of current global and societal developments. Carvalho (2020: 7) summarises for the European Parliament: "In the future, 90 percent of all jobs will require digital skills." While political programmes illustrate a willingness to enforce gender equality in the labour markets of EU-societies, studies illustrate an insufficient impact of the efforts.

Davaki (2018: 8) analyses the *digital gender gap* as a sub-area of the digital-divide problem regarding unequal distribution of access, use and chances in the digital transformation. His findings show that women and men approach, process and use digital means differently. Preponderantly, girls find themselves in family and school discouraged to pursue mathematic-technical interests (Janneck/Vincent 2017: 54). Young women chose seldom to study the natural sciences and technology-related fields (STEM[9]). Societally produced conceptions, validated early in primary and secondary socialisation, according to which mathematical and technical understanding is a men's affair, turn into stumble stones against equal chances of appropriation of the new digital world of work's offers. The European Parliament (2024a, b, c) issues a particular need of improvement for women's better inclusion in the ICT sector as a growing labour market with 120 000 new jobs every year, while the lack of skilled workers in this field will increase.

Academic female graduates are not only in ICT-related occupations a minority, female ICT graduates find themselves occupied below qualification, earn 19 percent less than male colleagues despite the same qualification, see no promotion prospects, are expected to work excessively and find themselves in a male-dominated, often sexist- and stereotype-loaded work atmosphere. This leads to a "leaky pipeline effect"; many of the few ICT-qualified women leave the work field after three to four years, as Carvalho (2020: 16) reports.

Women are foremost left out and stay out of explicit digital occupations. Economic calculations of the EU expect a yearly loss of production of 16.1 billion Euros (Quirós et al. 2018: 5) due to the infinitesimal number of women in the ICT sector. In Europe's labour market, innovative minds, ideas and applications corresponding to possible female-users are lost to

9 STEM is a study field of Science, Technology, Engineering and Mathematics (in German: MINT Mathematik, Informatik, Naturwissenschaften und Technik).

the digital growth industry (Misa 2010). Considering also *psychological costs* – discouragement to enter the future career field in the first place or to study STEM, but then encountering discouragement in pursuing a career, plus accompanying conflicts – the costs are even higher.

According to Sabbati et al. (2018), the digital gender divide seems rooted to a large extent in *stereotypes*. Psychologically speaking, stereotypes manifest by assignment of attributes as prejudices (Allport 1954) and incite social conflict. Overall, gender-specific stereotypes seem to experience a renaissance: social media and internet bubbles intensify stereotypical views of masculinity, needing as their counterpart stereotype femininity. Through the psychoanalytic lens, such femininity can be understood as a "container-function" (Bion 1997 [1962]) for the masculine, a fundamental concept in psychoanalytical understanding of unconscious communication and interaction. Rohde-Dachser (1992: 95) explains:

> "The asymmetric placement of gender differences construes a basal defence constellation, constructed for the patriarchate, in which the female, with strictly complementary purpose, stands for all excluded and repelled from masculinity. This is mandatory for the stability of stereotype gender arrangements."

Misogyny, sexism and violence against women grow recently online – EU efforts to constrain such issues by the Digital Services Act 2022 (European Union 2024) seem to fall short so far, also manifesting offline in an *increasing potential for violence and racism* in civil society: rising figures of domestic violence, mostly against women, are alarming and concern all classes (Bates 2021; Hedaiyati 2023). How societal acceptance of gender equality in the labour market and growing violence against women (and persons appearing female) in their private life can occur simultaneously is a topic of many recent publications, overall linking the concurrency to a masculinity crisis of (some) men in democratic western countries (Manne 2020; Levant/Pryor 2020; Clemm 2023; Kaiser 2020; 2023).

Accompanying the digital transformation, a renaissance of stereotypes and acted-out violence against women, both long thought vanquished, arises. While a small group of foremost white males are masters of the digitalisation process and wield real digital literacy, most people have only limited access to skills and knowledge behind the technology. Nevertheless, most are prone to go with the times as work life and everyday users. In this context, accompanying psychological strain might appear individualised but should be acknowledged as part of a larger structural pattern.

3.2 Heightened vulnerability of women by blending work and private life

While working at the home office, the available infrastructure and collegial support are diminished, and digital stress can rise. In this context, domestic violence against women becomes an additional issue. The Federal Ministry for Family, Seniors, Women and Youth[10] (BMFSFJ 2023) reports: "The number of victims of domestic violence in 2022 was 240 547, […] an increase of 8.5 percent compared to 2021." This trend continues; as Minister of Women Lisa Paus (BMFSFJ 2024[11]) highlights: "About every second minute, a person becomes a victim of domestic violence [...]. Every hour, more than 14 women fall victim to partner violence. Nearly each day, a partner or ex-partner tries to murder a woman." Taking into account an estimated dark field of about 80 percent, the figures are much higher. Hedaiyati (2023: 78), an experienced lawyer, observes that *most proceedings are closed* by public persecution – she sees a lack of willingness to acknowledge that in case of violence domestic cohabitants act no longer consensual.[12]

At home, violent-free work as well as psychological and physical integrity can get difficult; if a violent partner lives in the same household, the victim cannot evade. That a workplace on the business premises provides protection from violence for (foremost female) employees at home is not often discussed. But in light of increasing violence at home, despite the EU's Istanbul Convention[13] and the ILO Convention 190, and with an increase of *flexible digital work arrangements*, the issue must be considered. Legal expert Zimmer (2021) reflects on the reach of the ILO Convention 190:

> "As a rule, domestic violence does not fall under 'violence and harassment in the world of work' in the sense of article 1 paragraph 1 of the ILO Convention. This can be different in particular cases, for example when the workplace is located as a home office in the domestic field. And even if this is not the case, article 10 requires […] the states to acknowledge impacts of domestic violence against employees on work life and to

10 In German/references: Bundesministerium für Familie, Senioren, Frauen und Jugend (BMFSFJ).

11 Minister Paus cited at homepage of the Federal Ministry for Family, Seniors, Women and Youth (BMFSFJ) 2022.

12 See also the contribution by Püffel in this volume.

13 With the Istanbul Convention from 2011, the Council of Europe is combating domestic violence against women and girls.

'minimise its effects in the world of work'. ILO Recommendation 206 identifies appropriate measures to be taken […]" (Zimmer 2021: 6).

In light of current changes in how work is organised (increase of home office, virtual teams and virtual freelance work), this topic area refers to issues of societal gender relations, mirrored in, but not restricted to, the world of work. Beside the general digital divide, digital gender gap and gender pay gap, another societal disadvantage of women in the digital transformation becomes apparent, adding to the mix of disparity and vulnerability for women.

3.3 Inequality in the access to digital work equipment

According to Schwarze (2017: 95), her meta-analysis of studies confirms that workplaces of women are less well outfitted with digital equipment than that of men; access to digital appliances granted in organisations seems weighted down by a gender bias. This findings from *before* the SARS-CoV-2 pandemic might look different today; future studies will reflect on this question.

A gender-related warranting of digital work equipment and applications is also confirmed in the Initiative D21 et al. (2020: 22) study; in order to take along female employees sustainably, they propose *a transparent campaign* for technical equipment in conscious abandonment of any interconnection to gender or status. Additionally, the authors advise *participative processes* for technical implementation and design in organisations, so that groups distancing themselves and/or being distanced from the technology, such as female employees, are offered suitable chances of appropriation (Initiative D21 et al. 2020: 25). They also suggest *target-group-specific conceptualised* learning opportunities in order to "close gaps in the use of available digital solutions and in light of differences between age, gender, previous education, available equipment and time specifics for the goal of an increased inclusion of the user's perspective of women" (Initiative D21 et al. 2020: 31). Additionally, it might be prudent to consider *gender-sensible-trained didactic experts* instead of engaging one-sided tech experts.

3.4 Personnel management and biased digital means

Digital tools offered to companies as support for their personnel management become more common, but they are strongly suspected of containing white male biases of their programmers, as Carvalho (2020: 7) points out in her report for the European Parliament. Also, the German Women's Council[14] (2019: 16) expresses concern:

> "On the level of companies, a danger occurs that algorithm-based recruitment methods used in personnel recruitment are standardised by male employment biographies, thus containing a bias and leading to perpetuating discrimination against women with their often divergent biographies."

Such technologies are critically observed by the Ethics Committee HR Tech[15] (2022); its recent survey on ICT solutions in personnel management found eight automated applications already in use: biography analysis, recruitment advertisements, chatbots as contact answering questions, matching candidate's profiles with jobs, ranking of candidates, suggestions for personnel and career development measures, analysis of audio and video records for personality traits and competencies, and prediction of intentions to give notice (Ethics Committee HR Tech 2022: 11-18). This list illustrates how manifold and foremost unnoticed automated applications are insinuate in the labour market. Does a candidate/employee know that an AI analyses his/her data? Will an AI rank a female senior expert due to actual abilities and readiness or based on gender and age biases? Such biases with *exclusionary effects* in personnel recruitment and development are to be avoided.

Psychologists specialised in personnel diagnostics spent decades developing unbiased and valid methods (Preiser 1992: 5-35; Ackerschott et al. 2016; Kersting/Klehe 2018). For digital means in psychological personnel recruitment, Martin Kersting (2021: 395ff.) highlights the responsibility of human resource managers in light of AI-applications. By no means human expertise can be supplemented by digital assistant systems, as Martin Kersting cautions (2021: 404). The raised concerns mirror the critically accompanying of a process fully in progress. The experts point out that not the IT should drive personnel management ahead but that deciders have

14 In German/references: Deutscher Frauenrat.
15 In German/references: Ethikbeirat HR Tech (2022).

to make sure that *human expertise will still be predominant* in personnel management processes.

4. Additional thoughts about solutions

So far, some advice accompanied the discussion already. Which further solutions for the goal of *violence-free work as work of the future* can be derived with respect to the delineated structural disparities and vulnerabilities for women in the wake of the digital transformation of work?

In their recent study for the Third Equality Report of the German government, Hummel et al. (2020: 61) advice a gender-sensible development, analysis and implementation of digital means; they point out:

> "At all times it is true that, when gender aspects are observed, also other social groups profit from it. […] Regarding the gender dimension […] in its intersectionality provides a quality assurance loop for the protection of social modes of action as part of technological impact assessments, and this holds innovative potential."

Accordingly, a gender-sensitive approach *including technological impact assessments* could support overall paths opposite to digital divides, reducing the structural violence. Could the female ICT drop-outs ("leaky pipeline") become valuable future counsellors in this respect?

The German Women's Council (2019: 28) advocates:

> "Because of its impact on societal barriers such as economy, education, family, research, art, culture, government, public health, politic, consumption and sport, the digital transformation is of the highest societal significance. But topics such as access to education and to the labour market as well as communication are not sufficiently acknowledged as gender specific in the public discourse nor in political debates, and they are hitherto not sufficiently dealt with."

Accordingly, disparities in the digital transformation *should be discussed more audibly* in society and organisations.

Furthermore, the involvement of stakeholders was already highlighted as an approach to user-sensitive solutions. This could prevent a further loss of connectedness of women and other disadvantaged people in the digital transformation. The demographic development should be motivating enough for managers to develop their whole workforce's potential. From

the psychological perspective, an integrative, *participatory approach* must be advised.

The Expert Commission for the Third Equality Report of the German government[16] (2021: 9–10) assumes from a socio-technological viewpoint that the digitalisation opens a window of opportunity for the re-negotiation of power relations and the overcoming of gender and role restrictions. As a pressing example for gender disparities in digital means the authors issue the white male biases of programmers mirrored in their algorithms and derive an assignment for all organisations from this: not only to invest in digital technology but primarily to *evaluate with representatives of all stakeholders* which solutions will fit them best.

Summarising by the example of gender and for an intersectional perspective on equality, the digital transformation in organisations is currently an enormous field of design. Organisations would be prudent to link their efforts of gender equality, diversity management, occupational health management and digitalisation systematically for target-group-specific and integrative measures, thus counteracting pattern of structural violence while digitalising their work processes.

5. Conclusion

The analysis revealed a series of new and renewed disparities and vulnerabilities in the wake of the digital transformation of work. The danger of structural and interactional devaluation and marginalisation of women became apparent as a pattern of structural violence and psychological strain. Women's future gainful employment and the fulfilment of psychological human needs through work are questionable if digital and digitalised work is considered a men's domain. Could history repeat itself with regard to a new illiteracy and access-barriers for women? What if most women are at best kept at the substitute's bench and are impeded further to fully keep pace with the changes of the digitalising world? Intersectionally speaking, question marks remain also for older people, people with a migration background and people with low qualification in and beyond the labour market in light of the accelerated pace and fundamentality of changes by the digital transformation.

16 In German/references: Sachverständigenkommission für den Dritten Gleichstellungsbericht der Bundesregierung.

As a psychologist and researcher in the field of social sustainability at the workplace, I feel sure that society and organisations cannot afford not to invest in a diverse and inclusive work-related digital future. With realisation on the side of shareholders that their strategy in the competition for the best heads must include the advancement of female employees (and of talents from different age groups, et cetera), structural violence as part of the digital transformation needs structural answers, while the individual can mitigate effects in their direct environment and sphere of influence as best practice examples.

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