DIGIGEN

Professional career guidance for women in management positions in the field of digital competence

WOMEN, LEADERSHIP & DIGITALIZATION

A Report Based on a Literature Review

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CONTENT

1 INTRODUCTION

Digitalization is omnipresent and, at the latest, can no longer be ignored since the Corona pandemic. The same applies to the ongoing efforts to improve the proportion of women in management positions. Therefore, at the beginning of 2020, the European Commission came up with a Gender Equality Strategy 2020-2025, placing this issue at the centre of European policy: Women should be able to achieve professional and social goals in the same way as men and exploit their potential to the fullest (European Commission 2020). This includes an equal employment ratio across sectors, equal chances of work-life balance, and an equal share of care work (European Commission 2020).

The Erasmus+ project DIGIGEN "Professional career guidance for women in management positions in the field of digital competence," focuses on designing a counseling approach for guidance professionals to support women in planning their entry, entering, and remaining in management positions by making use of the digital transformation. So far, the authors of this report have not found any widely spread and known approaches to foster female leadership, specifically under digitalization, through an up-skilling program for guidance professionals. This will therefore be subject to the Erasmus+ Project DIGIGEN. This report focuses on women, leadership, and digitalization as well as their interfaces getting an overview of the literature. It will not specifically focus on the theory of counseling approaches because counseling will not be newly invented. Instead, this report aims to better understand women in management positions and their specific needs in the context of leadership and digitalization.

We differentiate two target groups in our project:

- HR practitioners and career counselors (direct target group)
- Women in management positions (indirect target group).

Our literature review should address the following topics:

- Changes in the management sector as a result of digitalization
- Legal norms and programs to promote women in management positions
- Digital skills need for people in management positions
- Previous qualification measures for learning digital skills
- Counselling approaches for women in management positions

The report is structured as follows: First, we would like to present a short overview of our search strings for the literature review over the countries Germany, Hungary, and the Netherlands. The following chapter will discuss the findings and conclude our report with a comprehensive summary.

2 DATA & METHODOLOGY

The databases for the literature search were EBSCO, Science Direct & Emerald in the first step. In addition, Social Science Research Network (SSRN) and websites of European and national non-profit or state-owned initiatives on that topic were also regarded as legitimate literature resources. The respective focus country supplemented the following search strings for a country-specific focus. "HR Practitioners" OR "Career Counsellors" OR Women AND "Management Positions" AND "Digital Skills";

"Change AND Management AND "Result of Digitalization"; "Counselling approach" AND Women AND Management; "Programmes to promote" AND Women AND Management; Qualification AND "Digital Skills" AND "HR Practitioners" OR "Career Counsellors" OR Women.

We generally follow the approach of Massaro/Dumay/Guthrie (2016) in the structured literature review for the research articles. However, care was taken to perform forward further and backward searches on the research articles consulted to ensure that we recognize other suitable articles for our DIGIGEN project.

3 RESULTS

3.1 Germany

3.1.1 Women and Leadership

The terms "women" and "leadership" did not go along for a long time. Although now, for many years, women have taken active participation in the active labor market, there is still a gap between men and women in general, specifically in management positions. The European Union and national governments have addressed the problem and designed regulations to improve the situation for women. In Germany, the Equal Participation Act of Women and Men in Leadership Positions in the Private and Public Sector (FüPoG) came into force in May 2015. The law aims to significantly increase the proportion of women in management positions in the private and public sectors. For the private sector, this means the introduction of a fixed quota of 30 percent of the respective underrepresented gender on supervisory boards for listed companies and subject to parity-based co-determination. Companies that are either

listed or subject to corporate co-determination and do not already have to meet the fixed quota must set their target values. In addition, the corresponding Equality Act of Women and Men in the Federal Administration was amended (BGleiG). For this purpose, the requirements for the equal opportunity plan were specified in more concrete terms and structured like the target size regulation in the private sector. Furthermore, the law obligates extensive reporting (annually) to inform the public about the development of the proportion of women and men in management positions. The facts presented here are based on the fifth annual information provided by the federal government in 2021 (Bundesministerium für Familie, Senioren, Frauen, und Jugend 2021). The following presents aspects of the proportion of women and men at management levels in the private sector through fiscal 2018 and 2019 and in the public sector through the end of 2019:

- Since the law came into force in 2015, the proportion of women in leadership has increased. For example, the ratio of women on supervision boards rose by 3.9 percentage points to 22.5 percent in 2018.
- In the case of listed companies and companies with equal co-determination, which have had to meet a fixed gender quota of 30 percent, there was an increase of 8.4 percentage points of women on supervision boards since 2015. As a result, the proportion of women was 33.4 percent in 2018. On the other hand, companies required to meet the quota increased the proportion of women on supervision boards by only 3.7 percentage points.
- The proportion of women on management boards of companies is low. In 2018, 8.3 percent and 79.5 percent of companies had zero women on their management boards.

- In the committees in which the federal government could appoint at least three members, the proportion of women in the mandates was 46.1 percent in 2018 and mostly only an offset of one seat.
- In the area of the highest federal authorities, there is still a significant potential for improvement. For example, in 2020, 37 percent of employees with managerial and supervisory responsibilities in the highest federal authorities were female.

Of the ongoing struggle, the current legislation (SPD, Bündnis90/Die Grünen, FDP; from 2021 to 2025) states in their coalition agreement the following passages to support leading women in general and women in the context of digitalization (SPD et al., 2021):

> „To make successes and needs for action more visible, we are expanding the basis for reporting the federal government's annual information on the development of the proportion of women and men at management levels and on boards in the private and public sectors and, if necessary, tightening up the law."
>
> „We want to increase the proportion of female founders in the digital sector. To this end, we are creating a scholarship for female founders and reserving a portion of the Zukunftsfond."

In conclusion, women in management positions are strongly supported by the German government to equal the existing gap between the number of male and female leaders. Unfortunately, although those laws and regulations have been in force since 2015, there has not been a vast improvement. Nevertheless, digitalization may allow women to set foot in management positions.

3.1.2 Digitalization and Leadership

Digital transformation processes have an impact on leadership and the competencies therein. Currently, the effects and bearing are unclear to a certain point. The research project "Digitalisierungskompetenzen – Digital Leadership" (Engl. Digital Competencies – Digital Leadership), funded by the Dr. K. H. Eberle Foundation, aimed to identify relevant competencies for successful leadership in digital transformation using a mixed-method approach. First, a meta-analysis of existing studies on digitalization, digital transformation, and competencies in German-speaking countries was carried out. These studies extracted many competencies that appeared significant for leadership in digital transformation. Next, these competencies were summarised by qualitative content analysis. In the next step, they were evaluated as part of a focus group workshop with representative practitioners. The resulting set of forward-looking competencies for digital leadership, including the associated descriptions and operationalizations, provides organizations and individuals with a better understanding and career orientation (DHBW Lörrach 2020).

As a result, the project identified ten competencies most relevant for successful leadership in digital transformation (Imbery et al., 2022, p. 103). These future-oriented competencies are:

- Agility: The ability to adapt oneself and the organization to changing conditions to achieve set goals in the best possible way. This includes reacting flexibly to unforeseen events and new requirements and acting proactively rather than just reacting to changes.

- Translation of Methods: The ability to understand, choose from, and adapt new methodologies in an environment of increasing dynamics and uncertainty to achieve the desired impact.
- Tolerance of Ambiguity: The ability to accept ambiguous situations and contradictory courses of action without evaluating them negatively or positively. Thereby resisting the urge to draw simplified conclusions. This includes seeing those conclusions in their specific context and making decisions under uncertainty.
- Product and business model design: The ability to create digital products and new business models for developing the economic potential of digitalization for one's company.
- Process innovation: The ability to design and introduce novel and significantly changed processes.
- Technology Trend Assessment: Identifying new technologies and resulting opportunities and assessing their impact and relevance to one's organization.
- Competence of transformation: The ability to design the process of fundamental changes in an organization and guide this process from a current state to a target state.
- Transdisciplinarity: The ability to think and act across disciplines by considering and integrating multiple perspectives.
- Facilitation: The ability to define a goal-oriented orientation framework within which employees are motivated and enabled to act self-organized and

purposeful for the organization's benefit and to feel responsible for the perception of internal and external changes.

- Competence of Networking: The ability to create an environment where networking is a prerequisite for collaboration. This includes establishing and maintaining relationships to communicate and interact to obtain information and overcome problems.

The above competencies mainly focus on the social and communicative aspects of leadership competencies in digital transformation. Nevertheless, technical knowledge and technological know-how were often mentioned during the practitioner's workshops. Both are highly relevant to successful leadership. The difference is that technical and methodological competencies are assumed to be future competence in general, but social and communicative competencies are more relevant for digital leaders (Imbery et al., 2022, p. 101). Similar results come from McKinsey's discussion paper "Skill Shift: Automation and the Future of the Workforce." It presents novel findings on the coming shifts in demand for workforce skills, competencies, and organizational work within companies as people increasingly interact with IT technology (McKinsey Global Institute 2018). Twenty-five workforce skills were defined and quantified by the time spent on each skill in 2016. The results forecast predicted changes in those workforce skills by 2030. In addition, a detailed executive survey of 3.031 respondents in Canada, the United States, and five European countries (France, Germany, Italy, Spain, United Kingdom) was conducted, as well as in-person interviews with chief human resources officers and other industry executives. Although those findings focus mainly on the effects of automation, some results also apply to leadership and digitalization.

- In Germany, the need for physical, manual, and basic cognitive skills will decrease by 22 percent. The need for higher cognitive skills will increase by 5 percent, social and emotional skills by 23 percent, and technological skills by 41 percent. The increase in the need for "digital skills will grow relatively slowly compared to the other focus countries. This will likely reflect Germany's relatively advanced technology application in the workplace, especially in manufacturing." (McKinsey Global Institute 2018, p. 15)
- The demand for social and emotional skills, significantly as leadership and managing others, will rise. It was found that future workers will spend considerably more time deploying these skills than they do today. "In aggregate, between 2016 and 2030, demand for these social and emotional skills will grow across all industries [...] by 22 percent in Europe. While some of these social and emotional skills are innate, such as empathy, they can also be honed and, to some extent, taught [...]" (McKinsey Global Institute 2018, p. 11). The demand for technological skills will complement the increase in social and emotional skills. Executive leadership teams will need to evolve along with the workforce and structure of their organizations.
- "Leadership and human resources will need to adapt: almost 20 percent of companies say their executive team lacks sufficient knowledge to lead the adoption of digitalization." (McKinsey Global Institute 2018, in-brief text)

In summary, McKinsey's discussion paper states that multiple skill shifts will apply to the future workforce. Therefore, leadership must evolve along this development and increase technological and social-emotional skills.

Another study from the Georg-August-Universität Göttingen (Germany) focused explicitly on needed soft skills for leaders embracing "New Leadership" (Lange et al., 2021). Commercial managers were interviewed in a qualitative, half-standardized interview. As a result, it was determined that increasing the use of digital structures often leads to decreasing hierarchy and, therefore, more personal responsibility on the employees' side. Thus, leaders should be able to trust in their employees' sovereignty and coach them sufficiently through those decision-making processes. In addition, the following essential cornerstones for »new leadership« are crucial: the reduction of concerns and fears of employees about digitalization, acting as a role model and coach in dealing with new tools, as well as recognizing the need to adapt to changed requirements and to provide the personnel with suitable development measures.

Similar results come from a study of the recruitment group Hays (Hays AG, Institut für Beschäftigung und Employability IBE 2017). In 2017 591 leaders in Germany, Austria, and Switzerland were asked for their opinions on competencies in a digital world. 82% consider change management the main challenge for leaders during digitalization. 61% feel that handling the increasing complexity of leading is a considerable challenge, and 55% say that establishing transparency challenges digital leaders. Additionally, 53% of respondents state that leadership needs to adapt to a new leading culture and flexible forms of work, and 42% of respondents see an increase in the complexity of processes and their management. In general, the study identifies the need for action in the following competencies for all employees and, therefore also, for leaders:

- The willingness to embrace changes,

- The capability to handle complexity, insecurity, and risks,
- The capability to think on the whole, understand processes, and prioritize,
- Self-Management and the willingness for life-long-learning,
- Communication skills and the ability to work in different teams,
- and the willingness to take responsibility.

In conclusion, digitalization impacts the competencies needed for a leading position and the way of leading employees without a concrete differentiation between men and women.

3.1.3 Women, Leadership, and Digitalization

Few concrete projects or studies deal with leading women in digitalization and the needed competencies. Nevertheless, two thoughts concerning the effects of digitalization on women (in management positions) are prominently discussed. The first thought connects to the competencies necessary in a digitalized leadership role. A study by Global Digital Women (Reimer & Onaran, 2020) asks their 30.000 network members about their thoughts regarding digitalization and its impact on diversity in the workforce. Competencies are relevant to digital leadership were named numerously. Those are similar to the competencies in the previous chapter because they mainly focus on social and emotional skills. The authors of this study identify those social and emotional competencies as primary female properties. Thus, female leaders may have a natural advantage in adjusting to the new requirements of digital leadership. Another thought concerning women in management positions in the context of digitalization connects to the current deficiency in equal share of care work.

In 2013 women did twice as much unsalaried care work and household jobs in a partnership with children and 1.3 times as much in a partnership without children (Destatis, 2015). At the same time, women often work in fields where the home office is more complicated to realize than in the fields most men work in. Leading positions can be digitalized more easily (Sachverständigenkommission für den Dritten Gleichstellungsbericht 2021), which might support the needs of women with care work. Global Digital Women's study supports this, with half of the female respondents seeing an improvement in Work-Life-Balance through digitalization, primarily if the respondents already work in a leading position (Reimer & Onaran, 2020). On the contrary, the opportunity for a home office has increased the amount of care and household work for some women if their male partners continue working in an office space (Sachverständigenkommission für den Dritten Gleichstellungsbericht 2021). Still, a review by Gulden and Thomsen (2021) points out the positive effect of the obligation for the home office during the COVID-19 pandemic. This obligation increased awareness and acceptance of men simultaneously doing home office and care work. They postulate that this awareness and acceptance will impact work-life balance and women's chances in management positions.

In conclusion, digitalization may help women better balance their work and personal responsibilities. Especially the digitalization of leadership could be a chance for women to enter the field of management positions. Additionally, women might naturally bring the competencies needed for digital leadership, which could give them an advantage in fulfilling a management position successfully.

3.1.4 Summary of Germany

Women still need much support in the labor market to reach the same level as men, particularly in management positions. The EU and the German government address this deficit in many laws and regulations, but there remains a long way to go until absolute equality. This report gave insight into the chances that digitalization might offer for women in general but also for women planning to enter, enter, or remain in management positions. The following findings for Germany could be made:

- The existing regulations and laws slowly improve the situation for women in management positions but still leave much freedom to the companies. However, the awareness of inequality is rising and may impact future development.
- Digitalization requires new competencies, which an up-skilling program for guidance professionals should address so they can be coached during counseling.
- Those competencies are of primarily social and emotional, as well as technical nature and mainly serve women as they are connotated as more female.
- Being able to work digitally might help women better balance their personal and professional lives. Not only can women balance it better, but also because the awareness of men doing care work is increasing due to digital opportunities.

3.2 Hungary

3.2.1 Women and Leadership

Even though the proportion of women managers in Hungary (39%) is above the EU average of 34% (European Commission 2021a), there is still room for development. Takács (2020) attempted to uncover why women still seem underrepresented in top management positions despite being increasingly qualified. She has found a strong correlation with rigid structures and traditions in many enterprises. Women struggle more than men to find a balance between private and working life, possibly facing a sexist work environment. Liptay (2021) found in company-wide research that work-life balance is the essential criterion for employee satisfaction for half of the female managers. Regarding skills required for success, Hungarian executives considered building personal networks and strong communication skills more important than the world average. Their worst fear was losing their jobs due to automation. Kézai et al. (2020) explored the role of women in the startup world by providing a comprehensive picture of the state of female-led startups and the factors affecting their operations in today's Hungarian startup ecosystem. They revealed several limiting factors that hinder female-led startups. These, too, are typically due to family and social reasons. Furthermore, women are exposed to the glass ceiling phenomenon in the workplace. Education is considered most important in these circumstances. These findings are the article of Klára Tatár-Kiss (Tatár-Kiss, 2021), who conducted a survey in 9 countries that regards the gender differences between a US holding company and its international daughter companies. Hungary was the most masculine country among the survey participants, with a masculinity index of 88. According to Hofstede, the founder of the idea, a masculine society is determined by the spirit of

competition, striving for success, people live to work, material goods are essential, and conflicts are handled by aggression. It is highly required in management positions to be self-confident, capable of making decisions, and to give directions. The study refers to Rudman-Glick, who points out that if a woman gets into a leadership role in a masculine society, she automatically has to take on a leading masculine attitude. The female workforce in the former socialist countries, especially in the financial sector, is the highest, but they are seldom in a leading role. In comparison, Sweden, France, and Spain, which are feminine countries, have more women in leading positions. The final conclusion is that even if the company culture regulates many processes, the national culture mainly affects a daughter company's feminine or masculine atmosphere.

The action plan (2021-2030) of the Hungarian government with the title "Consolidation of Women's Role in the Family and the Society" forms several goals to promote women, especially in poorer regions and in minority communities (Magyarország Kormánya, 2020). Part of the plan is projects like the VEKOP-Project, which motivates young adults with 4,5 million forints not refundable financial support to find their own company in Hungary. Women managed 47% of the supported companies by July 2020. The study points out that in Hungary, the salary between the male and female workforce shows a shrinking difference; the gender pay gap is claimed to be the lowest within the EU. In 2018 the government started a new program for women with the ambition to take part in public life. The program focuses on the importance and influence of women in the economy, society, and public life. It combines education and practice; participants can meet influential national and international personalities, managers, politicians, and experts. The DESI Index shows few female

employees in the IT sector. They are also underrepresented in the economy, science, professional training, and politics. One aim is to increase the proportion of women in these fields by motivating them with further training, mentor programs, and qualifications. There are also programs to educate the digital competencies, especially of women. It would be inevitable to build digitalization in adult education. There are two concrete goals to encourage women in jobs where they are underrepresented: by career counseling in secondary schools and advertising for mathematics, life-sciences, technical sciences, and informatics by making scientific life more attractive with scholarships and prices, especially for women (Magyarország Kormánya, 2020).

The Hungarian Business Leaders Forum was founded in 2005 as a dedicated Forum for Women in Leading Positions to open a dialogue between female leaders and top managers in economic and political life in Hungary. Group members are women in executive positions. In addition, the Forum organizes professional events in Hungary and abroad, offering a networking platform and trying to build out more female leaders with a mentor program (Hungarian Business Leaders Forum s. a.).

Hungary also took a leading role in the empowering project of the European Commission that aimed to empower females to engage in self-employment and entrepreneurship (HÉFTA 2022).

3.2.2 Digitalization and Leadership

Recent statistics show that Hungary is still behind in digital development compared to other EU countries (European Commission 2021b) and by global standards (International Institute for Management Development 2021). Even so, Hungary is one of

the top risers in the field of digital transformation in Europe (European Center for Digital Competitiveness 2021), a fact that assumes the possibility of dynamic development in the field.

Researchers of the Corvinus University Budapest examined Hungary's DESI Index (Digital Economy and Society Index) to get an overview of the current status of digitalization in the human capital sector (Tóth-Kaszás et al., 2021). Twenty-two percent of the Hungarian population does not have digital skills, 25% has minimal knowledge, 25% has basic knowledge, and 28% has outstanding knowledge. This is lower than the EU average. More than 60% of the workforce used a computer, which is also far from the EU average. This means that the Hungarian population is not yet ready for digital transformation; there is a lot to do regarding education for the workforce and the transformation of companies. (Tóth-Kaszás et al. 2021) Digital knowledge is mainly limited to user skills. Direct access to digital knowledge is through school education or self-tuition. There are still difficulties in adopting ICT systems and the new approaches to the daily educational routine (Pécsi Tudományegyetem, 2017). This is why digital development cannot succeed without the support of educational institutions. In 2017 companies complained that graduates lacked mathematical-statistical competencies, the ability to analyze and solve problems, self-reliance, and the self-marketing of their ideas (Nagy, 2017). Education has to develop from 3.0 to 4.0, which means a combination of natural and virtual information and new virtual resources, like VR headsets. This new digital learning environment requires cooperation between companies and universities. This virtual learning space can also be used to educate employees. Schools and universities have not only to focus on technical and professional skills but also on soft skills, like team spirit, critical thinking,

communication skills, time management, etc. (Tóth-Kaszás et al., 2021). The labor market has changed a lot since the global economic crisis in 2008; it is more and more demand-oriented, with a growing value of soft skills. Nearly all professions need digital knowledge. (Pécsi Tudományegyetem 2017).

Regarding the business sector, nearly all Hungarian businesses had an internet connection (94%) by 2020, and 63% had their home page. 23% of the total income of all Hungarian companies came from electronic commerce. Integrating other digital technologies, such as 3D printers, was extremely low (3% of the companies). Only 6% used extensive data analyses for business purposes. Internet of Things (IoT) was utilized in 14% of Hungarian enterprises. Artificial intelligence, such as chatbots, was used merely by 1,5%. (Központi Statisztikai Hivatal 2021). Companies offering comprehensive services to aid digital transformation in all sectors are also present in Hungary (SAS, 2022; Trend FM, 2022). As cloud-based technologies gain ground, the spread of digital service management is forecast (Portfolio, 2022).

The research project of Obermayer et al. (2021) revealed the attitudes and perceptions of business leaders toward digital transformation and Industry 4.0. It is reported that even though there is a lot of uncertainty and unease about the upcoming changes, companies are becoming more confident and ready to adopt the new technologies during proceedings. However, the diversity of IT systems, data protection concerns, and high costs stand in the way of digitization. Bencsik (2021) perceived similar manager attitudes in her study but also reported a lack of enthusiasm and motivation regarding the changing work environment.

Szloboda Gábor, the managing director of Idya Hungary, a company specializing in digital processes, points to the human factor as a key to successful transformation.

Managers and co-workers must be convinced that the new technologies will make their work more accessible (HRPower, 2022). Focusing on the agricultural sector, Olga Berta (Berta, 2018) has drawn similar conclusions from her study: "Without the IT training of agricultural enterprises and their managers, the persistence of these deficiencies will mean long-term competitive handicap (...). Suppose the owners and those in management do not consider the competition in applying IT devices in global agriculture. In that case, it will harm their economic efficiency and profitability".

Móricz 2022 analyses data from a 2019 survey that investigated the competitiveness of Hungarian companies focused on leadership preparedness, awareness and planning, skills and resources, and openness and responsiveness factors of digitalization readiness. Most companies (63%) were fully prepared for the digital transformation. The others lacked digital awareness or the necessary resources (regarding budget and technology). The survey found that expectations were very high regarding implementing digital strategies, but this does not necessarily mean that the presented strategies were all sound. A pivotal moment here would be determining specific measures instead of defining general goals. The most prosperous areas of digital development were customer relationship management and information systems for decision support (DSS). The author notes that this survey has concluded before the outbreak of the COVID-19 pandemic, which is widely believed to be a most relevant factor in speeding up digitalization measures, especially in remote working.

The importance of digitalization strategies among Hungarian retail companies was shown in Matyusz & Pistrui 2020. The authors found that the companies analyzed in their study also had access to underlying technological tools. An important finding is that Hungarian company leaders must broaden their horizons to achieve digital

success; the sole arrangement of allocating financial resources will not be sufficient. Therefore, it is recommended in the paper that the management should appoint a person in charge of implementing the digitalization strategy. Marciniak et al. (2020) also suggest that management positions should be dedicated to digital transformation. In a paper from 2020 (Hortoványi et al., 2020), the authors investigated whether Hungarian executives are prepared for the impact of digital transformation on workplaces. While conducting the survey, business executives perceived labor shortage, but few realized that the 'low/medium value-added low-wage model was no longer sustainable. The results also indicate significant employee resistance to digital transformation, and managers are not prepared for the change management tasks. They believe the key is to educate leaders capable of managing digital transformation by developing, disseminating, and operating model practices, curricula, and incentives.

In a paper addressing the topic of the influences of digital transformation on the HR sector (Poór et al., 2019), the authors describe the results of their survey from 2018, in which HR managers (57%) and workers from other positions (43%) took part from overall 259 Hungarian companies. In contrast to global trends, the authors have found that most Hungarian respondents consider management conversion the critical element, whereas organization development was considered less important. The authors concluded that the Hungarian HR branch is aware that digitalization will cause significant changes in human resources management. However, there is common consent regarding the main areas for development: lifelong learning, adjustment, and personal growth within the organization.

Realizing the significance of digitalization, the government of Hungary launched 2015 a program to aid citizens and businesses in the process of digitalization (Digitális Jólét Program / Digital Success Programme). A follow-up measure is a strategic framework (DJP2030) for international cooperation and digital governance (Magyarország Kormánya, 2022). Furthermore, end of May 2022, the establishment of a new organization called Digitális Magyarország Ügynökség (Digital Hungary Agency) was announced, with the main task of the digitalization of the government and the creation of digital citizenship (Magyarország Kormánya, 2022b).

A non-governmental organization (IVSZ) facilitating digital transformation to achieve competitiveness in business proposed a strategic plan on a broad range of fields of action. One of the main areas of these recommendations is the education and skill development of human resources regarding digitalization (Informatikai, Távközlési és Elektronikai Vállalkozások Szövetsége 2022).

3.2.3 Women, Leadership, and Digitalization

Female managers agree that digitalization helps women to progress in their careers. In addition, the internet and smartphones help them to keep the balance between family and work life. However, the biggest challenges in Hungary are the lack of qualified and talented employees, technological development, and rapidly changing regulations, which is not a gender-specific problem (KPMG Hungary 2018).

Nevertheless, digitalization also has its adverse side effects. A survey (Nagy, 2020) among twenty female senior managers on how mobile devices affect their work-life balance showed that it is even harder for them to put their mobile devices aside when

they finish work as it is for their male colleagues. The extended maternity leave, established in the last decades of socialism, and the social pressure that mothers are the main care-holder for their families in combination with a high-commitment career, can cause guilty conscience. This can explain why the advantages of mobile technology are rated higher than the disadvantages. They generally do not see it as a burden; if they are disturbed in their spare time or during the holiday, it is considered a legit part of their well-paid job. Working mothers feel pressure to succeed in work and within the family. They use their cell phones to be available for distant mothering and show interest and responsibility for work even after working hours. In contrast, they seldom use ICT for private purposes during working hours and mainly to organize family life, which is still women's responsibility. This way, companies can colonize space and time reserved for family life (Nagy, 2020).

If we look at the companies in Hungary, there are several initiatives for women in the IT sector. For example, there is cooperation between Vodafone Hungary, Lenovo, and BookR Kids to make female employees visible, present girls with possibilities in the IT sector, and break down existing stereotypes. Vodafone's target is to make 40% of the management out of women by 2030. Currently, 15% of the "startuppers" are female in Hungary, and only 9% is the quote of the female executive in the technology sector. Huawei also does a lot for female employees, e.g., the SEED grant in Hungary, which prioritizes female engineers against their male counterparts (Kotroczó, 2021).

3.2.4 Summary of Hungary

In Hungary, there is an awareness of the problems of digital transformation on the one hand and the career development of female managers on the other – this is established in various programs and projects launched by the Hungarian government and the private sector. Still, unfavorable personal attitudes, rigid structures, and the lack of appropriate education can also be observed. Appropriate and specific counseling could positively influence these factors, for which this report has not found any common practice in Hungary. Apart from appropriate qualifications and preparation for digital transformation, the most crucial element would be to address the balance between women's work and private life to build confidence that they can achieve a breakthrough even in adverse conditions. However, women in Hungary have the right skills and, most of the time, even qualifications; they need help and support to make the most of them.

3.3 The Netherlands

3.3.1 Digitalization

Information and communication technologies (ICTs) are a core aspect of the fast-changing economy in the 21st century. Along with ICTs comes the general requirement for people to increase their knowledge and perform in the increasingly complex and interactive work environment (van Laar et al., 2017, p. 577). Van Laar et al. (2017) refer to such requirements as 21st-century skills, which people must acquire to enter the workforce in 2022 and the following years. Those 21st-century skills include "collaboration, communication, digital literacy, citizenship, problem-solving, critical

thinking, creativity, and productivity" (van Laar et al., 2017, p. 577) and relate to the overall economic situation. Besides general 21st-century skills, people must provide digital skills to succeed in the labor market. Such digital skills are "searching and evaluating information, solving problems, exchanging information or developing ideas in a digital context" (van Laar et al., 2017, p. 578). Although both concepts (21st-century and digital skills) are crucial to the workforce, an established combination is not yet. This deficiency led van Laar et al. (2017) to conduct a systematic literature review on 21st-century and digital skills and develop a concept of 21st-century digital skills. The main objective was to "(1) examine the relation between 21st-century skills and digital skills; and (2) provide a framework of 21st-century digital skills with conceptual dimensions and key operational components aimed at the knowledge worker" (van Laar et al., 2017, p. 577). In general, the authors consider 21st-century digital skills as:

- "[...] the mastery of ICT applications to solve cognitive tasks at work;
- [...] skills that are not technology-driven, as they do not refer to the use of any particular software program;
- [...] skills that support higher-order thinking processes; and
- [...] skills related to cognitive processes favoring employees' continuous learning." (van Laar et al. 2017, p. 578)

In particular, and as a synthesis of 1592 screened articles, from which 75 met the predefined criteria, twelve different skills were reported as core 21st-century digital skills or contextual 21st-century digital skills. The following list presents those skills in

descending frequency of mention (n = the number of times the skills were mentioned in the reviewed literature) (van Laar et al., 2017, pp. 582–583):

Core 21st-century digital skills

- Information management (n = 31) – *skill to use ICT to efficiently search, select, or organize information and choose the most suitable source for a given task*
- Critical thinking (n = 30) – *skill to use ICT as a source for informed judgment and reflected reasoning*
- Creativity (n = 29) – *skill to create new ideas and content by the use of ICT*
- Problem-solving (n = 24) – *skill to use ICT to process and understand a problem and find a solution cognitively*
- Collaboration (n = 24) – *skill to use ICT to interact with others effectively*
- Communication (n = 22) – *skill to transmit information and express effectively*
- Technical (n = 18) – *skill to use (mobile) devices and applications and orientate in online environments*

Contextual 21st-century digital skills

- Self-direction (n = 16) – *skill to set one's goals and manage the process of reaching those goals with ICTs*
- Lifelong learning (n = 10) – *skill to constantly improve one's knowledge and capabilities by using ICTs*
- Ethical awareness (n = 9) – *skill to behave socially responsibly when using ICTs*
- Cultural awareness (n = 9) – *skill to show cultural understanding when using ICTs*

- Flexibility (n = 8) – *skill to adapt one's thinking or attitude to changing ICT environments*

In a subsequent study by van Laar et al. (2018), the authors conducted cognitive interviews, a survey pilot, and a survey among a large sample of professionals working within the creative industries to elaborate on a measure for 21st-century digital skills. As a result, they present a validated instrument to measure six types of 21st-century digital skills. Those skills include communication, information, collaboration, critical thinking, creativity, and problem-solving (van Laar et al., 2018, p. 2184). After the pilot test of the predefined items to measure 21st-century skills, the following categories with specific items per skill were defined. Creativity and problem-solving skills are not divided into sub-categories; they are assigned with items directly.

- Information management: *define/access, evaluate, manage*
- Communication: *appropriateness/expressiveness, content sharing, contact building, networking*
- Collaboration: *responsibilities, planning, interdependence, knowledge sharing*
- Critical thinking: *reflection, justification, novelty*

Following this measuring instrument for 21st-century digital skills, van Laar et al. (2019a; 2019b) then conducted another study, which elaborates on the determinants of digital skills and the relation of digital skills to each other. 1.222 professionals from the Netherlands directly involved in creative work processes participated in an online survey. The survey collected data on digital skills via the predeveloped 21st-century measure and data on various determinants via selected items from different measuring instruments.

The final and overall conclusion from the study is that a unique set of determinants explains each skill. This highlights the barrier to skill development "as the proposed skills vary due to the different individual background variables" (van Laar et al., 2019b, p. 100).

"An important finding is that, except for critical thinking digital skills, the results confirm that all skills lead directly to problem-solving digital skills" (van Laar et al., 2019a, p. 3478). Furthermore, in general, all given digital skills sequentially build on each other, meaning lacking one skill might likely result in lacking another (van Laar et al., 2019a, p. 3462).

The combination of determining properties and interdependent 21st-century digital skills means special care must be taken while appropriately designing an initiative to support women in leading positions.

In conclusion, digital skills range from widely known technical competencies to the often overseen contextual competencies. Furthermore, those skills build on different determinants and are of a sequential and conditional nature. Therefore, counseling on such competencies/skills must focus on specific selections and the overall situation of a woman in a management position.

3.3.2 Women and Leadership

A paper study by Non et al. (2021) looks at the demographic characteristics of people with different digital skill levels and relates those to labor market outcomes in the Netherlands. Relevant to the DIGIGEN project are the results on digital skills, employment, and labor force participation regarding the situation of women. A general,

non-gender-related outcome is that with increasing digital skills, the percentage share of employment increases (Non et al., 2021, p. 21). Additionally, people with low(er) digital skills are often older, lower educated, or – which is essential for the project DIGIGEN – female (Non et al., 2021, p. 1).

In 2018 the Government of the Netherlands entered the Gender & LGBTI Equality Policy Plan of the Netherlands into force (Government of the Netherlands 2018). This policy plan aims at enabling everyone's chance to live the life they desire regarding the situation of "(i) the labor market, (ii) safety, security and acceptance, and (iii) gender diversity and equal treatment" (Government of the Netherlands 2018, p. 5).

Regarding women in management positions, the policy plan states the following:

> "The number of women in senior positions is still too low, especially at the top of organizations, and this situation is not changing fast enough. Appointing women at this level is essential not just from the perspective of social justice but also because only then do we make the most of the abilities of the increasingly well-educated female half of the workforce. An economy thrives best when it utilizes all the nation's talents. The government is committed to diversity and inclusivity in the broadest sense and actively promotes them within companies and organizations. Greater diversity in the upper echelons can also help create a more inclusive climate at every other level." (Government of the Netherlands 2018, p. 9)

The main goal will be to increase awareness of the situation and find ways to improve the situation for women in the labor market. To archive this goal, the Dutch Senate approved a bill to maintain a quota for the number of women at the top of the

business world in 2021. Starting on the 1st of January 2022, companies listed on the Dutch stock exchange must fulfill a quota for women in top management positions. "In time, the supervisory boards of these companies must be composed of at least one-third women and one-third men. Each new appointment to the board must help meet this target" (Government of the Netherlands 2022). In addition, the largest companies in the Netherlands must:

- "Set appropriate and ambitious targets;
- draw up an action plan for achieving these targets;
- report their results yearly to the Social and Economic Council and include this information in their directors' report." (Government of the Netherlands 2022)

In conclusion, women in management positions are strongly supported by the Dutch government to equal the existing gap between the number of male and female leaders. However, the outcomes must be awaited since this regulation only started in 2022.

3.3.3 Summary of the Netherlands

Women still need much support in the labor market to reach the same level as men, particularly in management positions. The Government of the Netherlands addresses this deficit by raising awareness of existing deficiencies and setting up regulations to improve chances for women. Still, there remains a long way to go until absolute equality.

4 CONCLUSION

If we look at the literature findings from the countries in an overall view and put our results in the context of the DIGIGEN project goals and the aims of the literature review based, we can state the following:

Changes in the management sector as a result of digitalization:

- Based on our literature review, there is a research gap on where interfaces between women's leadership and digitalization and related competencies lie and how these could be used to empower women in management positions. However, also missing here is an approach to concrete implementation.

Legal norms and programs to promote women in management positions:

- Women are still at a disadvantage in career development compared to men. However, based on the countries considered, the governments are aware of this and have also initiated programs to counteract it or are already in the evaluation phase.

Digital skills need for people in management positions:

- It is also important to note that in implementing empowerment programs at the interfaces of women in management positions and digitalization, particularly digital skills must be taught (e.g., concrete tools). However, core skills (e.g., creativity, critical thinking) and contextual skills (e.g., cultural awareness, flexibility) should not be ignored to maximize the success of an empowerment program at the interfaces of women in management positions and digitalization.

Previous qualification measures for learning digital skills:

- The results suggest that basic skills up to and including systemic thinking are essential for taking advantage of digitization in one's career planning. However, this also seems to be gender-unspecific. Conversely, this means that programs that want to use the identified interface to improve women's career development should not be particularly technical-specific but the system- and competence-oriented.

Counseling approaches for women in management positions:

- It is noticeable that the direct target group (career charterers and employees in HR departments) has hardly been considered in the interfaces leadership, empowerment of women, and digitalization so far. Nevertheless, also on the part of women, this interface is not yet seen as an opportunity to support career development.

General:

- There are no fundamental country-specific features to be noted based on our literature review.

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