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Closing the Gender Gap: Initial Findings and Lessons Learned from a German Medium-Sized IT Services Company's Efforts for Career Changers

Research Paper

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Abstract. Digital transformation is driving demand for information technology (IT) professionals. Addressing the underrepresentation of women in IT is a promising way to expand the pool of potential candidates. This research aims to determine how women without IT-specific knowledge can potentially contribute to reducing the gender gap in the German IT sector, especially for small and medium-sized enterprises. A case study with qualitative interviews within a medium-sized IT service company was conducted to answer the research question. The results reveal that targeted job advertisements can successfully introduce women from other sectors to the possibility of a career change in the IT environment. In this way, new female employees can be recruited, reducing the gender gap.

Keywords: Job reorientation, lateral entry, gender, information technology (IT) sector, women

1 Introduction

For many years, women have been significantly underrepresented in computing professions (Russo, 2015). Although the latest Global Gender Gap Report indicates that Europe has the second highest level of gender parity at 76.6% (World Economic Forum, 2022), in 2021, only 19% of women worked in information technology (IT) professions in Germany (Liebig, 2022). The demand for IT specialists is increasing due to the ongoing digital transformation (Specht, 2022). However, Germany currently has a shortage of IT specialists, with 124,000 unfilled positions in 2022 (Bitkom Research, 2022), a gap that is expected to worsen, not the least due to demographic changes (Wunsch & Buchmann, 2019). Small and medium-sized enterprises (SMEs) often face the challenge of recruiting qualified IT personnel (Vinten, 1998), which is a problem because SMEs dominate the German business landscape in terms of numbers and economic performance. More than 99% of all companies in Germany are SMEs (BMWK, 2022).

Interestingly, an analysis of the size of German IT companies reveals that the proportion of women increases with company size (Bitkom Research, 2022), which means that the proportion of women in SMEs is comparatively low.

Therefore, there may be an opportunity for SMEs to focus on encouraging women to work in IT (Liebig, 2022), as this could have several advantages: it would address the shortage of skilled workers and increase diversity within a company. A high level of diversity offers companies a significant competitive advantage and increases productivity and innovation (Díaz-García et al., 2013); thus, diversity goals should generally be defined as business objectives (Terstiege, 2023). Therefore, targeting women with a potential career change in the IT environment can be a useful way for SMEs to fill staff shortages with a target group represented well in other sectors while improving the performance of the entire organization by increasing its diversity. In the context of this work, we pursue the research question *of how to reach job-seeking women from other fields as potential career changers to reduce the gender gap and shortage of skilled workers in SMEs.*

Based on a single case study of a medium-sized German IT service company with insight from five interviews with successful career changers, we draw initial conclusions about the measure of career reorientation. We analyzed the opportunities in the IT environment for women who have previously chosen other careers and do not have specific IT skills. We examined how to reach the relevant target group, the concrete possibilities for a career change, and the hard and soft skills helpful during the onboarding process. These initial findings and lessons can be used as a starting point to guide organizations through the career transition into various positions and levels in IT companies and organizations.

This paper first explains the theoretical foundations of the gender gap, the phenomenon of job reorientation, and the skills needed for an occupation in the IT sector. Then, it details the methods and results. Finally, this paper discusses the findings and concludes with the limitations and future research directions from this study.

2 Theoretical Background

2.1 Gender Gap and Job Reorientation

In the work context, the gender gap is an expression of the division of labor between the sexes, partly due to entrenched structures of past processes of exclusion, segregation, or discrimination, contradicting modern concepts of equality (Kreimer, 2008). Ahuja (2002) developed a conceptual model of the challenges faced by women in IT at three stages of their careers: Career choice, persistence, and advancement. For each career stage, she identified social and structural factors that may act as barriers (Armstrong et al., 2018).

Regarding career choice, consistent statements from several female interviewees in a study by Brämer et al. (2020) demonstrated the importance of providing potential future female IT workers the opportunity to delve into the depths of IT and learn about its structure while still in school. In this way, women can be encouraged to pursue an

apprenticeship or degree in IT at the beginning of their careers (Brämer et al., 2020). According to Termer and Nissen (2011), achieving a good work-life balance is critical as women in IT consulting progress in their careers. Another study on career opportunities revealed several cultural and environmental factors that both hinder and help women's careers. Barriers include a male-dominated culture and a conservative, non-consensual, and hostile work environment. Enabling factors include challenging work opportunities and employee-oriented work culture (Berghi & Bielli, 2015).

Some theories seek to explain the gender gap in IT careers: expectancy-value theory, role congruence theory, and domain-specific ability belief theory (Moghaddam, 2010). The commonality among the expectancy-value theory, role congruence theory, and domain-specific ability belief theory in explaining the gender gap in IT careers is their recognition of the influence of individuals' beliefs, attitudes, and expectations regarding career choices and outcomes. They suggest that gender differences in these beliefs, such as perceived ability, value placed on IT careers, and alignment with gender roles, contribute to the gender gap observed in IT career participation. These previous findings presume initiative-taking engagement and activity in the IT field based on these theories.

Recruiting can be defined as those actions and activities of an organization primarily to find potential employees (Barber, 1998, p. 5). According to Barber (1998), recruiting has three phases: generating applications, maintaining applicant status, and influencing job choice. Due to the shortage of skilled workers, recruiting IT personnel is one of the greatest challenges for companies (Luftman et al., 2009). The IT recruitment measures currently discussed in the literature refer to different challenges. A targeted job advertisement approach for jobs socially perceived as more "male-dominated" can significantly increase the application rate of women and attract qualified female candidates. In addition, including a statement that applications from all genders are welcome is advised (Del Carpio & Guadalupe, 2022).

However, the question remains regarding how women who initially chose careers outside of IT can be reached as potential career changers. In other sectors, such as medicine, research has already explored how a shortage of skilled workers can be addressed by recruiting lateral entrants (Schwill et al., 2016). The German Medical Association has adopted lateral entry to address the growing shortage of general practitioners. These findings might also be applied to the IT environment.

Career changers, or people seeking job reorientation or a lateral entry, are people who, in the course of their lives, consciously choose a different activity as a means of earning a living than the one they originally learned (Knecht, 2014). According to Knecht, companies should consider taking a step toward these candidates in areas where there is and will be a shortage of skilled workers (Knecht, 2014).

Women have been disproportionately overrepresented in health and education occupations and in the service, media, advertising, sales, and tourism sectors for many years. However, their share in technical professions has remained low (Schönfeld & Tschirner, 2017). In previous recessions, the unemployment of low-skilled workers became entrenched, and it is becoming clear that technological change is also affecting middle-skilled workers. Promoting new hiring, supporting skill development, and enabling occupational reorientation are crucial to avoid entrenchment (Hutter & Weber,

2020). The pandemic particularly affected tourism and contact-intensive occupations, such as hairdressers, restaurants, and providers of personal services. All these sectors have a high proportion of female employees (Tertilt, 2022). Due to the accompanying economic transformation, job reorientation is becoming increasingly necessary for employees, providing opportunities for IT companies (Hutter & Weber, 2020). The high proportion of female employees in these service sectors suggests numerous potential career changers for the IT sector.

2.2 Skills in the IT Sector

The half-life of knowledge in the IT industry is expected to be one year (Jendrosch et al., 2011) due to the rapid pace of technological development, requiring constant updating of knowledge. Therefore, vocational training and initial studies in the industry are only basic training, where learning skills and flexibility of thought and action are developed above all. The constantly changing technical expertise should be acquired in a lifelong learning process. Thus, IT-specific hard skills, which might be helpful during familiarization, are not considered when examining the possibility of a lateral entry.

As digital transformation disrupts old structures and perspectives, innovative company cultures characterized by a willingness to learn, overall curiosity, and customer orientation are considered particularly relevant and important (Glaser, 2022). According to research by Trauth et al. (2010), such characteristics as communication, relationships, and team skills are typically considered female, whereas integration, analysis, implementation, and programming are considered male. Ebert (2020) views goal-oriented communication as an essential social competence for distributed work, and Aengenheyster and Dörr (2019) considered IT communication to be a central, enabling, and controlling component of transformation. According to their research, internal and external IT communication must be proactive rather than reactive or become so if it does not meet these requirements. Based on these findings, this paper focuses on possible soft skills (Dean, 2017). In IT consulting, there are areas of responsibility where, for example, strong communication and analytical skills are critical (Drews, 2012). These soft skills are considered particularly important for jobs in the service sector (Salvisberg, 2010).

3 Method

3.1 Methodological Approach

This paper contributes to academia and practice by exploring whether the gender gap in the IT sector, especially in SMEs, can be reduced through targeted job reorientation for women. Thus, we chose a qualitative, descriptive, case study research approach (Miles & Huberman, 1994) consisting of two parts. The first part analyzes the job advertisements successfully used to recruit four of the five lateral entrants (IP1–IP5). The interviewee IP5 chose to stay within the company after an internship. The second part contains semi-structured interviews with these five employees. In general, case studies

are a research method that allows researchers to study real-life phenomena in their "natural setting(s), using multiple data collection methods [such as interviews, observations, document and text analysis] to gather information from one or a few units..." (Benbasat et al., 1987, p. 370). Descriptive case studies allow researchers to conduct in-depth observations, including processes and outcomes, making case studies well suited to addressing "how" and "why" questions (Yin, 2002).

The interviews were conducted with female employees who had already been hired for a lateral move and were seeking a new career direction. We chose a semi-structured interview style based on predefined questions to ensure that key topics were covered in the interview. This style also allowed for a dynamic response during the interview to consider further topics and obtain more detailed information through questions to gain deeper insight (Gläser & Laudel, 2010). The interviews were recorded with the consent of the interviewees and then transcribed, following Kuckartz and Rädiker (20022). All questions were open-ended and could be answered freely. Open-ended questions were considered appropriate for conducting the interviews, as the possible answers to the selected questions were not known in advance, and an unlimited number of answers existed (Sökefeld, 2020).

The findings from the interviews were categorized according to the structure (i.e., different thematic parts, marked in bold in Section 4) to determine the industries from which women were recruited as career changers and the reasons for their search for a new job. Whether the newly recruited female employees thought a job in the IT sector was one of many feasible options, whether they consciously searched for a job in the IT environment, or whether they did not deliberately consider this career move are also analyzed. This analysis provides insight into the job titles under which potential career changers might be recruited. In addition, the interviews were used to determine what prior (non-IT-specific) knowledge, experience, and soft skills were considered helpful after a successful career change.

3.2   Case Company and Interview Participants

This study focuses on a medium-sized German IT service company that has been serving global corporations and SMEs for over 20 years. The company currently employs about 50 people in various departments. Before recruiting female career changers, approximately 80% of the employees were male. New employees have already been recruited for the back office, project management, and first-level support through job advertisements for career changers.

The five interviewees are employees of this medium-sized IT service provider and were recruited as potential career changers (each with a different job title) in four of the five cases through the company-specific job advertisement described and analyzed in Section 4. The job postings were advertised with the suffix "m/f/d" and the note "lateral entry possible." The deliberate use of female job titles aims to directly engage potential career changers, attracting women interested in new careers across all sectors, whereas alternative titles, such as "hotel management assistant" or "tourism management assistant," target female candidates in their current industry, potentially prompting them to consider a change of direction.

The interviews were conducted on January 12, 2022, via Microsoft Teams. Each interview lasted approximately 15 minutes and was guided by a 15-question questionnaire (available from the authors upon request).

The interview participants (Table 1) were women of different ages (between 23 and 42) with an average age of 31.2 years. These women have been with the company for 8 months, in three other cases for about 2 years, and for more than 10 years in the longest case. Based on this, we consider the interview participants successful recruitments. Two employees were recruited as lateral entrants from the hotel industry for the back office and first-level support via the job titles "office communications clerk" (IP1) and "hotel specialist" (IP3). In first-level support, the company hired another career changer who previously worked in the florist and tourism industries (IP4). A new project manager was hired after she decided to pursue a different course of study in science, technology, engineering, and mathematics (STEM) and then managed projects in other non-IT sectors (IP2). Another project employee has been with the company for more than 10 years after gaining insight into an IT company during an internship while studying business administration with a focus on management and marketing (IP5).

Table 1. Interview participants

	Current position	**Area**	**Year joined**	**Age**	**Education**	**Recruited job title**
IP1	Management assistant	Back office	2022	42	Hotel clerk	Office communications clerk
IP2	Junior IT project manager	IT project management	2021	32	Chemical laboratory assistant	Project manager
IP3	IT service desk agent	First-level support	2020	23	Hotel clerk	Hotel clerk
IP4	IT service desk agent	First-level support	2021	26	Tourism management assistant, florist	Tourism management assistant
IP5	IT project manager	IT project management	2012	33	Studies in economics with a focus on marketing	Quality manager

4   Results

Designing the designated job advertisements with specific and potentially surprising job titles is crucial to reaching potential female career changers. The design choices are based on the assumptions that knowledge and experience from other service sectors can be helpful for a lateral entry into the IT services sector and that women are active in the

selected sector or are searching for corresponding job offers (Tertilt, 2022). The job advertisements that were successfully used to recruit the interviewed employees were, among others, announced under the following job titles, in each case with the suffix m/f/d and the note lateral entry possible: office management assistant, office administrator, hotel clerk, tourism management assistant, quality manager, and project manager. Within the German language, these job titles entail the ending -men (-mann) or -women (-frau) as, in the example of "Bürokauffrau." The German-language job titles were deliberately chosen in the female form to address potential career changers as directly as possible (Schönfeld & Tschirner, 2017). The choice of job titles, such as office management assistant, is intended to appeal to women searching for a new career in all sectors, not just the IT sector. Using alternative job titles, such as hotel management assistant or tourism management assistant, is intended to reach female candidates searching for a new job within their current industry who, after reading the advertisement, may consider a change of direction due to the additional content. In both cases, the goal is to reach potential career changers who, unlike in the case of IT-specific job titles, are made aware of the possibility of working in the IT environment due to the targeted approach.

According to Rippler and Woischwill (2014), a successful application campaign begins with an intensive examination of the company and the applicant's professional situation. Within the job postings for the case company, potential applicants are addressed directly (e.g., "We miss you as ...", "We need you," or "We are looking forward to you!"). In addition, the job posting is written in a deliberately relaxed style to reduce possible reservations or fear of contact. For example, "At the end of each day, ask yourself: 'Are you done yet?' This remains between us!" The job advertisement conveys a sense of professionalism and seriousness, including the apparent partnerships (e.g., with Microsoft). The target group is again directly encouraged to consider a career change: "Every week you will get to know the system better and be able to solve customer problems independently."

The job description and selected requirements clarify that the advertised jobs require organizational talent, effective communication skills, and a focused, structured, and careful way of working. These skills are critical in several areas of the IT service company under consideration (e.g., in the back office, project management, and first-level support). Specific areas of responsibility are described separately under the heading "Onboarding," including appropriate measures to facilitate induction, for example, for the area of first-level support:

For the first two weeks, your daily routine will consist of the following:
- Watching webinar recordings and trying out what you have learned at your modern workstation.
- Listening to live calls from your team members using our learning headsets.
- Taking your first calls from our users. (Advertisement)

This approach assures the target group that they will be supported, especially in the initial phase, and that structured training will be provided using appropriate measures.

In addition to attractive conditions, such as a permanent employment contract and a good work-life balance with flexible working hours, there are other attractive offers for

employees. For example, these include competitions linked to possible e-learning courses and free lunches, including lectures for continuing education in everyday working life. An innovative working environment and a good working atmosphere are also promoted. Last, there is an invitation and encouragement to apply, including details on how to proceed. Short telephone interviews were also possible (e.g., after work or on the weekend).

All five female interviewees did not specifically search for a job in the IT field, nor did they consider working in this field. However, it was possible to address them because the job title was oriented toward their previous occupation (e.g., IP3: hotel specialist and IP4: travel agent) or was deliberately kept general (IP1: office management assistant). Due to cross-industry job titles, two new female employees were recruited as career changers (i.e., IP2: junior project manager and IP5: quality manager).

The **reasons given for seeking a new job varied**. However, from the interviews, external factors in current events have a significant influence. Since the beginning of the coronavirus disease 2019 (COVID-19) pandemic, employees from the hotel, catering, and tourism sectors have been forced to search for other jobs (IP3 and IP4) and have been open to lateral entry into other sectors. In other sectors, such as mechanical engineering, layoffs for economic reasons were also a decisive factor in the search for a new occupation (IP2). Moreover, IP1, like IP3, came from the hotel industry but proactively decided to change jobs. The desire for a better work-life balance was the main reason for the change: "More personal, private, family reasons, to have more time for my two children."

The interviewees were asked whether they had proactively considered working in the IT sector and whether they would advise other women to make a career change to the IT sector, to determine the **potential for recruiting women as career changers**. It is striking that three out of five female respondents (IP1, IP3, and IP4) would not have been aware of the possibility of working in IT before seeing the job advertisements. In addition, IP4 stated that she had specifically searched for job advertisements from the tourism industry, including the keyword "lateral entry," but had not considered the IT industry. The other two respondents (IP2 and IP5) had previously decided to study elsewhere. In one of these two cases (IP2), the job advertisement for career changers also pointed the way to IT after the corresponding career aspiration was rejected due to other recommendations from the family background. In the other case (IP5), in addition to the publication of job advertisements, direct contact through cooperation with (higher) education institutions can also be conducive to recruiting new employees concerning a possible lateral entry. The interviewee mentioned that she would not have looked for a job in the IT sector after completing her studies with a focus on management and marketing. These two respondents (IP2 and IP5) would also recommend a career change in IT to other women under certain conditions. According to one participant,

> If someone is looking for a new challenge and wants to go down a completely new path, then definitely yes. Just because you don't have much to do with IT doesn't mean you don't fit in. In fact, it does, especially if you are very structured and have been in management or sales before, those activities are also needed in IT, for example. (IP5)

Respondents were asked for concrete **reasons and their motivation to apply** to the job advertisements. While the small number of interviews must be considered when interpreting the answers, several triggers were mentioned, most of which are equally important. The general interest in IT and continuing education was evident in two of the five interviews. In addition to the advertisement's pleasant, appealing wording and the appropriate job title, the company benefits were also mentioned as a trigger for the application.

During the interviews, the participants were asked about their prior **assumptions about jobs in IT**. It was mentioned that these jobs often involve software development and programming. Further, IP4 mentioned thinking that the field of IT is "very complex and you can't really get into it without prior knowledge and training." Moreover, IP5 also imagined an IT job to be monotonous "in the sense that it's really purely based on code and stuff, and there's not a lot of interaction going on." According to IP3, the following impression emerged from the personal interviews: "When you say you work in IT, nobody thinks of a specific area. Everybody thinks you can also set up hardware or program [and that] everybody can do everything—sort of a motto." According to IP2, people "always picture this nerd sitting at his or her computer 24/7, tinkering away and being totally uncommunicative." Moreover, IP2 added that it has been shown "that exactly the opposite is true." A very similar assumption and contrasting impressions of reality were shared by IP1, "Sitting in a cubicle hammering on the keyboard... Not what I've experienced here."

The interviews revealed that the **actual impressions about work in IT and intrinsic rewards gained through work in IT**, in reality, contradict the image described previously. In addition, when asked what she particularly likes about working in IT, IP2, who works at the service desk, replied, "That it's very varied and there's always something new to do and that you still have customer contact without having to sit face-to-face with the customer, which was not always pleasant." This comparison referred to her previous job in a travel agency. Further, IP3, who is also a member of the service desk team, likes "the variety, the customer contact, and that you can help with problems." Moreover, IP5 added,

> I didn't realize before, and I found it fascinating that you're not looking for a solution, but we're looking for the best way to provide computer-based support. It has a lot to do with what people ultimately do in their day-to-day work. I wouldn't have thought that.... It's very versatile. You have contact with people who are not IT-savvy, you bring understanding and look at how you can make life easier for these people through automation and things like that. I enjoy looking for those solutions. (IP5)

Regarding **onboarding**, the interviews revealed that personal training by other team members plays a crucial role (IP1, IP4, and IP5). It also became clear that knowledge databases and documentation (also referred to as "solution articles" in the interviews) are considered helpful for training, especially in the first-level area (IP3 and IP4). Further training through e-learning and other methods takes place in the back office and project management, according to the results of the interviews. In project management, existing knowledge without IT connection is perceived as helpful. For example, IP2 stated, "I think it was exactly this background in chemistry—the analytical thinking

with the protocols—that helped me to structure everything and to prioritize things to see where the focus is. That was very helpful."

5 Discussion

In this study, the first step was to investigate whether job advertisements that specifically target potential female career changers can help close the gender gap. The results suggest that choosing appropriate job titles in advertisements can attract potential female career changers. The respondents originally worked in other service industries, such as hotels, restaurants, or tourism, and were successfully recruited through targeted job advertisements. In summary, the considered measure represents a significant opportunity for SMEs and potential female applicants.

The selection of possible target groups should consider each industry's specific situation, including external factors. For example, during this research, it became clear that COVID-19 was responsible for career changers in other service industries (tourism, gastronomy, and the hotel industry). In this respect, IT offers a crisis-proof workplace. Especially in IT services, many problems can be solved remotely, and face-to-face communication is often unnecessary (Altholz et al., 2022). In most cases, the career changers did not believe it was possible to work in IT without specific knowledge, nor did they consciously think about it (IP1, IP3, IP4, and IP5). The interview with IP2 reveals that other job seekers can also be recruited as career changers in cases where the career aspiration existed in the past but was discarded.

Based on the successful recruitment of the interviewees over the past few months, it can be assumed that lateral entry into medium-sized IT service companies is possible without specialized IT knowledge in the first-level area, project management, and the back office. Moreover, certain (non-IT-specific) knowledge and measures, particularly soft skills, can contribute to a successful induction during a lateral entry.

A fundamental, gender-specific separation according to typically female characteristics, such as communication, relationships, and teamwork skills, and typically male characteristics, such as integration, analysis, implementation, and programming (Trauth et al., 2010), is questionable. For example, women also use analytical skills (a typically masculine trait) in their daily work. In the interview, IP2 said, "I think just that background in chemistry, the analytical thinking with the protocols, helped me to structure everything and to prioritize things to see where the focus is. That was very helpful."

In terms of communication skills, which are often classified as female traits in the literature (Trauth et al., 2010), IP2 responded to the question about helpful knowledge and skills: "Also, the talking to people. I used to be a little inhibited. In college, you talk in front of a lot of people. It's calmed down now, it's less nervous." These responses reveal that the soft skills mentioned by Trauth et al. (2010) and associated with gender can be learned regardless of gender, even if the traits are classified as "typically female" but are not directly present in the corresponding gender or even if the traits have been perceived as "typically male."

Concerning the soft skills focused on in this study, according to Ghorbani (2023), information and communication technology companies require trained, competent, leading, and experienced project managers. They further conclude that the most vital elements of a successful project manager, for example, include a combination of knowledge, skills, leadership, abilities, and personal attitude required for successful project completion; thus, neither soft skills nor hard skills should be considered exclusively (Ghorbani, 2023).

While this research focuses specifically on how to encourage women to choose a career in IT, even if they may have previously chosen a different career path, we do not want to encourage a mindset of favoring one gender over the other. Like all other aspects of life, the corporate world should provide equal opportunities for all people so that no gender is favored over the other in the search for suitable candidates. However, gender-sensitive recruitment can help increase the number of good applications in the competition for suitable staff and motivate potential candidates to apply (Personnel Office of the Senate of the Free and Hanseatic City of Hamburg, 2017).

6   Conclusion

With this work, we sought insight regarding the research question of how medium-sized IT service companies can attract new female employees through the possibility of lateral entry. The results demonstrate that women can be reached and recruited as new employees through targeted job advertisements, particularly by choosing suitable job titles and structured approaches to job reorientation. The described measures can contribute to reducing the gender gap and the shortage of skilled workers. Due to the rapid technological development and associated short half-life of knowledge in the IT industry, non-IT-specific hard skills and especially valuable soft skills should be assigned appropriate importance.

There are some limitations to this work. The number of interviews was limited, and only one medium-sized IT service company was considered. Further research could more closely assess other possible industries from which women can be recruited as career changers into IT and which other activities can be considered for entry, considering various types/sizes of IT companies. In addition, further measures for successful induction, training, and possible career opportunities in medium-sized IT service companies can be analyzed. This work assumes a binary representation of gender and sex that does not reflect the diversity of gender identities. Further research should broaden this scope.

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