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Abstract:

This panel report outlines key insights from the Hello Diversity! Hackathon on gender equality in the workplace, held digitally in November 2020. The one-day event with more than 150 participants featured panel discussions and ideation sessions to enable the participants to develop innovative tools, strategies, and processes to minimize gender inequality in workforces involved in digital innovation. Overall, the hackathon aimed to build bridges between research and practice to derive answers on how existing barriers towards more gender equality in digital innovation processes and outcomes can be addressed. The theoretically informed challenges that were tackled during the event concerned topics such as stereotypes and discrimination, incentivizing workforce equality, and necessary support infrastructures in public and private spheres. The developed solutions indicate that much remains to be done to address the lack of processes, organizational structures, and holistic knowledge regarding the importance and benefits of diversity and inclusion in digital innovation. The hackathon culminated in pitches made on the envisioned solutions to kick-start their implementation and encourage research support and progress.

Keywords: IT-Workforce, Gender Equality, Digital Innovation, Diversity, Hackathon.

[Department statements, if appropriate, will be added by the editors. Teaching cases and panel reports will have a statement, which is also added by the editors.]

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1 Introduction

Combining the words 'hack' and 'marathon', a hackathon is an exploratory problem-focused event aimed at brainstorming, creating, and pitching prototypes of primarily digital innovation (Briscoe & Mulligan, 2014). We organized a hackathon to promote the science-driven development of solutions to tackle gender inequality in workforces involved in digital innovation. This type of innovation refers to both the digitalization of innovation processes and the utilization of digital technologies for the creation of novel products and services (Bharadwaj et al., 2013; Boudreau & Lakhani, 2013; Nambisan, 2017). The overall topic of the hackathon was inspired by the observation that digital innovation is increasingly transforming the way we communicate (e.g., Telegram & WhatsApp), work (e.g., Trello & Mural), and do grocery shopping (e.g., Instacart & Gorillas). Despite its far-reaching implications for our private and professional lives (Dery et al., 2017; Nambisan et al., 2019; Yoo et al., 2012), the workforces envisioning and implementing digital innovation are still far from being inclusive (Houser, 2019; Suseno & Abbott, 2021; Trauth, 2013; Trauth et al., 2018). Especially women, who are still considerably underrepresented in positions dealing with the exploration of digital opportunities (Gorbacheva et al., 2019), tend to be merely entrusted with the exploitation of digital innovation potentials identified by others (Schmitt et al., 2020). Recent statistics show that women in tech-related fields hold only between 27-38% of senior leadership, 23% of executive and 29% of senior manager positions, even though they make up for nearly half of the workforce (Catalyst, 2022). These numbers are particularly surprising given the repeated research findings that gender-diverse teams are better at identifying crucial innovation potentials (DuBow & Ashcraft, 2016; Wynn, 2019), performing complex tasks (Choi, 2002; Lechler, 2001), achieving firm growth (Eisenhardt & Schoonhoven, 1990; Hmieleski & Ensley, 2007; Rohner & Dougan, 2012), and increasing employer attractiveness (Simard & Gammal, 2009). By contrast, neglecting diversity in the workforce is shown to lead to unfavorable consequences, such as the (unintended) exclusion of certain groups from the use of digital innovation or the untapped exploitation of corresponding innovation potential (McAdam et al., 2019; Olbrich et al., 2015). Hence it is crucial to ensure that gender diversity, among other diversity dimensions (Sundermeier et al., 2020), is reflected in all aspects of digital innovation, from their creation and development to deployment, management, and impact (Cushman & McLean, 2008; Trauth, 2017; Urquhart & Underhill-Sem, 2009).

For more than two decades, scholars in the information systems (IS) field have focused on the development of gender-aware theories to derive explanations for the underrepresentation of women in tech workforces (e.g., Ahuja, 2002; Allen et al., 2006; Panko, 2008; Trauth, 2017). It was found that, for instance, gender inequality can be attributed to (unconscious) gender biases (Ahuja, 2002; Sundermeier & Steenblock, 2022), hostile environments that underrate the contributions of women (Hewlett, 2014), glass ceiling effects (ibid), and household obligations that prevent particularly women from fulfilling their full work potential (Tiwari et al., 2018). On the workforce level, the resulting inequalities affect women's productivity (Cohen-Charash & Spector, 2001), mental health (Schmader et al., 2008; Borrel et al., 2010), private and work-related relationships (Tiwari et al., 2018), quality of work-life balance (ibid) and, ultimately, their commitment to and satisfaction at the workplace (Hicks-Clarke & Iles, 2000). In addition, it is found that the conscious and unconscious discrimination of women negatively affects their career opportunities, which becomes visible in the dearth of women in leadership positions (Eagly & Carli, 2007), and the longer duration for women, compared to men, to advance their careers (Blau & DeVaro, 2007), resulting in considerable gender pay gaps (e.g., Peterson & Morgan, 1995). On an organizational level, inequalities decisively influence what kind of digital innovation potentials are explored and how these are exploited (Bharadwaj et al., 2013; Nambisan et al., 2017). In fact, numerous examples indicate that the limited perspectives inherent in homogenous workforces made them unable to identify flaws in digital innovation processes and outcomes (Olbrich et al., 2015; Sundermeier et al., 2021; Trauth, 2017). To combat these personnel and organizational implications and promote gender equality in digital innovation processes and outcomes, tech companies such as Google, Facebook, and Twitter invested considerable resources in initiating changes to enhance equality in their workforces (Peck, 2015). However, a recent study by Wynn (2019) found that most initiatives tend to be ineffective due to attempting to change individuals (referred to as 'fix the women' approaches) rather than the organizational culture and its inherent doctrines regarding the merits of gender equality (referred to as 'fix the system' approaches). Despite these insights, the exploration and exploitation of digital innovation is still predominantly treated as gender-neutral in the academic literature (Schmitt et al., 2020). As a result, neither academia nor practice currently offers comprehensive approaches to improving gender equality in digital innovation.

To collaborate on ideas aimed at addressing these gender imbalances in digital innovation, we set out to organize a digital hackathon - the Hello Diversity! Digital Ideation Hackathon on Gender Equality in the Workplace - held in November 2020 with more than 150 international and interdisciplinary participants from academia and practice. The overall aim of the hackathon was to develop new visions, tools, strategies, and innovative ideas that offer new directions for more equal workforces in digital innovation. Seven speakers and five coaches guided the participants through an online day of ideation, design thinking, prototyping and ultimately pitches on suggested solutions. These activities were framed by an opening Keynote by Vera Schneevoigt, the former Chief Digital Officer and Senior Vice President Engineering at Bosch Building Technologies, who emphasized:

> *"There is especially a need for women supporting women, as there are not enough women that show their talent. In addition, we need to provide men with the platforms they need, on the journey to gender equality, and include male role models in this discussion. I encourage everyone to raise your voice for gender equality and follow up with your ideas. Every idea is valid*." (Vera Schneevoigt, Bosch Buildung Technologies)

This was followed by a 'Morning Coffee Panel Discussion' involving founders, United Nations' 'HeforShe[1]' activists, and corporate transformation consultants, who highlighted the experienced obstacles to gender equality and perceived reasons for gender imbalances in workforces concerned with digital innovation. Based on these insights, participants spent the rest of the day in breakout rooms to develop ideas and (prototypical) solutions to achieve more gender equality. The 13 challenges that were addressed throughout the day were informed through a) a review of the literature on the current state of research on women in IT workforces (see Trauth and Connolly (2021) for an overview), and b) discussions with experts. The challenges thus derived concerned existing stereotypes and discrimination, incentives for workforce equality, necessary support infrastructures, and the involvement of public and private stakeholders (see Table 4 for more detailed information).

The digital format of the hackathon enabled us to hold an event with participants from all over the world, while the flexible structure allowed them to combine their participation with family duties. In summary, this digital hackathon was framed by the following two overarching questions:

- How can barriers to gender inequality in digital innovation be addressed?
- How can digital technologies support such initiatives?

To derive answers for these questions, the hackathon built bridges between research and practice to reveal novel insights and initiate strategic changes towards greater gender equality for workforces in digital innovation. One of the initiatives that emerged in the hackathon and was launched shortly afterwards is '30over30'[2]. It has ever since received considerable media attention. The team behind the initiative aims to increase transparency in venture capital funding to tackle gender biases that inhibit women to raise sufficient capital to finance the exploitation of identified digital innovation potentials (Brush et al., 2008: Greene et al., 2001: Kanze et al., 2018).

This report is structured as follows: In the next part, we offer theoretical perspectives on gender (in)equality in digital innovation, grounded in feminist theories, to provide a foundation for the 13 challenges that were tackled during the hackathon. In the third part, we provide a detailed description of the digital hackathon, including its goals, agenda, an overview of participants, and the challenges that were addressed. In chapter four, we summarize key insights and ideas from the digital hackathon experience, and reflect upon those based on the theoretical framework to identify new research opportunities. In addition, we provide IS research suggestions that support the development of the suggested hackathon ideas. Moreover, we discuss the ideas which resulted from the hackathon against the background of IS research contributions. Lastly, in section 5, we summarize our findings and present an outlook.

[1] www.heforshe.org
[2] https://twitter.com/30over30vc

2 Theoretical Perspectives on Gender-(In)Equality in Digital Innovation and IS Research

The theoretical foundation for the hackathon was derived from literature on 'women in tech' that yields valuable insights on the determinants of gender inequality in technology-oriented workforces (e.g., Allen et al., 2006, Armstrong et al., 2018; Trauth & Connolly, 2021; Trauth et al., 2018; Trauth, 2013). The main barriers preventing women from entering, staying in, and advancing in these workforces were identified as (unconscious) gender biases held by actors responsible for recruiting and promoting employees (Ahuja, 2002), hostile environments that evaluate supposedly 'typical' characteristics of women as inferior (Hewlett, 2014), and the glass ceiling effect that prevents them from advancing in their careers (Armstrong et al., 2018). These challenges not only inhibit women's contributions to the exploration and exploitation of digital innovation potentials (Hewlett, 2014; Schmitt et al., 2020), but also influence the core values on equality embedded in organizational cultures (Trauth, 2017). This, in turn has fundamental implications for the type of value offerings that are created (Brush et al. 2017). To avoid the (unintended) exclusion of certain user groups that are experiencing disadvantages when using digital innovation (McAdam et al., 2019; Olbrich et al., 2015), it is crucial to ensure that gender diversity, among other diversity dimensions (Sundermeier et al., 2020; Sundermeier & Mahlert, 2022), is reflected in all aspects of digital innovation, from their creation, through to development and deployment, in management, and evaluation (Cushman & McLean, 2008; Trauth, 2017; Urquhart & Underhill-Sem, 2009). To answer the research questions "How can barriers of gender inequality in digital innovation be addressed?" and "How do digital technologies support such initiatives?", we describe perspectives on gender-(in) equality in digital innovation, and related perspectives in the IS literature that are rooted in feminist theories. To that end, Trauth (2013) and Gorbacheva et al. (2019) identified three theoretical perspectives on gender in IS research: gender essentialism, the social shaping of gender, and gender intersectionality. These perspectives allow for a fundamental understanding of gender equality in the workplace and provide the starting point for defining the 13 challenges that were addressed during the hackathon.

2.1 Gender Essentialism

The first perspective, gender essentialism was until recently the most used in IS literature (Brown et al., 2010; He et al., 2007; Trauth, 2013; White Baker et al., 2007) and is rooted in liberal feminist theory (Harding, 1987). The underlying assumption of gender essentialism is that men and women act and think differently because of differences in their biological sex. The underlying assumption of the gender binary is used to describe opposite masculine and feminine natures (Wajcman, 1991), with women and men each considered as their own group (Trauth, 2013). According to this perspective, inequalities that persist in workforces concerned with digital innovation are attributed to structural and discriminatory barriers as well as systematic biases that prevent women from, or at least make it more difficult for them, to participate in the exploration and exploitation of digital innovation potentials (Armstrong et al., 2018; Brush et al., 2017). Empirical evidence shows, for instance, that women in certain regions still have unequal access to IT-related education (Adya, 2008), experience gender pay gaps (Joseph at al., 2015) and discrimination in IT workforces (Armstrong & Zaza, 2016), are excluded from informal networks of relevance for their career advancement (Kirton & Robertson, 2018), and are prevented from rising beyond a certain hierarchical level due to the glass ceiling effect (Armstrong et al., 2018). Armstrong et al. (2014) attribute these barriers to the structure, hierarchy, and culture of organizations. These findings indicate that women are disadvantaged in existing power structures and therefore face greater barriers to contributing their perspectives, experiences, and knowledge to digital innovation processes and outcomes. Moreover, these barriers affect women's career choice in IT and their career advancement (Gorbacheva et al., 2019).

This gender essentialism perspective on gender inequality has, however, limitations, as men and women are distinguished primarily on the basis of their biological sex (Gorbacheva et al., 2019). In addition, it holds women responsible for dealing with the structural disadvantages that prevail in workforces concerned with digital innovation and suggest that they have to adapt to the existing order, rather than the latter having to be challenged and changed by society (Ahl, 2004; Calás & Smircich, 1996; Trauth, 2002; Wajcman, 1991).

2.2 Social Shaping of Gender

A more nuanced distinction between biological sex and socially ascribed gender is made in studies that focus on the social shaping of gender and gender roles, which is rooted in social feminism (Trauth &

Quesenberry, 2007; Trauth, 2013). Scholars that examine digital innovation from this perspective are interested in the social implications of gender, its effects on the social order in digital innovation processes and in the social shaping of gender identities in IT workforces (Ridley & Young, 2012; Wajcman, 2000; Webster, 2004; Woodfield, 2002). These research foci imply that gender is seen as being socially performed rather than biologically predetermined. Observed gender differences in digital innovation processes and outcomes are attributed to a person's (1) socialization, (2) ascribed societal roles, and (3) experiential backgrounds (Harding, 1987). These differences are cited as the reason why men and women have different perspectives and interpret similar situations differently (Brush et al., 2009; Calás & Smircich, 1996). They are also reflected in the motivation and approaches of women to explore and exploit digital innovation potentials (Sundermeier et al., 2018; Schmitt et al., 2020). Findings from IS literature indicate that environmental influences such as societal expectations (e.g., social and cultural factors) and organizational norms (e.g., hierarchy, work culture, policy) affect women and men differently when exploring digital innovation (Armstrong et al., 2012; Trauth, 2017). For example, attitudes about black women working with innovation and technology are typically perceived as negative, whereas attitudes about white men exploring and exploiting digital innovation are seen as positive (ibid). This gender bias implies differences in their career paths in IT industries due to gender-based differences of personal and professional experiences (Ahuja, 2002), and still triggers the association of women with parenting and caring responsibilities (Trauth, 2017). Overall, fostered a deeper understanding of the causes of gender inequalities in the workforce, but the underlying idea of measuring women against an unstated male norm of exploring and exploiting digital innovation is critizised (Gorbacheva et al., 2019).

2.3 Gender Intersectionality

The third theoretical perspective, which is gaining momentum in IS literature, is rooted in intersectional feminist theory (Crenshaw, 1990) and post-structuralist feminist theory (Harding, 1978). This perspective rejects the gender binary (Trauth & Connolly, 2022) and emphasizes that gender needs to be seen as intersecting with other attributes, such as socio-economic status, sexual orientation, ethnicity, and race (Crenshaw, 2018; Trauth, 2013). IS research based on this perspective enables the study of differences among women in digital innovation by shedding light on the interplay of gender and other attributes (Trauth & Connolly, 2021), e.g., gender and ethnicity of black women who participate in or are excluded from digital innovation processes (Trauth, 2013). This perspective therefore offers a more holistic understanding of gender inequalities in workforces concerned with digital innovation, as it goes beyond gender to focus on additional attributes that explain differences between women who engage in digital innovation and those who do not (Adya & Kaiser, 2005; Trauth & Connolly, 2021). Furthermore, this perspective allows for the inclusion of underrepresented digital innovators who are rendered invisible by the imposition of gender binarity (Trauth, 2013).

These three perspectives on gender inequality in digital innovation processes and outcomes provided the scientific foundation for the challenges addressed by the participants during the hackathon. To this end, we shared these perspectives in advance of the event with the conference committee, who discussed and determined 13 challenges based on these perspectives. The committee decided to narrow down the challenges to stereotypes and discrimination, workforce equality incentives, and necessary support infrastructures in the public and private sectors, as they saw these as the most pressing in the (mostly European) context in which they were working. A detailed overview of the key challenges with sub challenges can be found in Table 4.

3 The Hackathon

To address the previously outlined gender inequality in workforces concerned with digital innovation, the Freie Universität Berlin provided a grant that enabled us to initiate and coordinate the 'Hello Diversity! Digital Ideation Hackathon' in early November 2020. The overall aim of the hackathon was to purposefully support a diverse audience of academics and practitioners to discuss existing inequalities and develop innovative solutions. The entire event took place online due to the COVID-19 pandemic. Despite these circumstances, we were particularly keen to create an environment that would foster innovation and creativity. To this end, we developed a multifaceted concept with pre-structured building blocks, e.g., energizers, panel discussions, and testing of creativity techniques, which guided participants step by step through the day. All participants were divided into teams of 4-5 people, depending on which gender equality challenges they wanted to tackle. To ensure that teams would perceive the hackathon as a starting point to following up their ideas after the event, each team had the opportunity to win prizes for

further developing their ideas, such as expert mentoring and coaching. The event was publicly announced and open to everyone who was interested in the hackathon's topic. To reach a broad target group, and to invite a variety of perspectives on the topic, we initiated a marketing campaign through Instagram, LinkedIn, and various academic networks. All in all, 153 participants attended the event. Table 1 shows an overview of the participants.

Table 1. Participants by Category

Participants	Definition
Scholars (N=23)	Professors, Postdocs and PhD students from diverse disciplines (such as IS, management, and entrepreneurship)
Practitioners (N=72)	Startup founders, policymakers, diversity managers of global players, diversity and corporate transformation consultants, employees of diverse organizations, industry leaders etc.
Students (N=58)	Bachelor and Master students from different disciplines in higher education institutions

In order to guide the participants purposefully through the day and, at the same time, ensure that all teams work in a goal-oriented manner, we structured the one-day event through several working sessions. These were designed to, first, provide participants with insights and inspiration for understanding the challenges, and subsequently, in workshop sessions, to develop and discuss potential solutions to gender inequality in digital innovation, before presenting them to others and receiving feedback. The three building blocks were: 1. Inspiration, 2. Group Work, and 3. Receiving Feedback. Table 2 contains a visualization of the detailed structure of the day.

Table 2. Visualization of Digital Hackathon Building Blocks

Agenda	Building Block	Purpose
09:00 am	1.1. Welcome from the Hosts, Introduction & Tech Intro	1. Inspiration
09:30 am	1.2. Opening Keynote by Vera Schneevoigt	
09:45 am	1.3. Morning Coffee Panel Discussion, moderated by CoWomen	
10:15 am	2.1. Design Thinking 1 – Understand existing challenges	2. Group Work
11:25 am	2.2. Design Thinking 2 – Ideate, brainstorming ideas	
12:30 pm	*Mindfuel Lunch Break & Optional Talk with Start-Up Consultant*	*Inspiration & Mentoring*
01:00 pm	2.3. Design Thinking 3 – Cluster Ideas & Create Concept	2. Group Work
03:00 pm	3.1. Pitch Presentation of Results in front of Jury	3. Receiving Feedback
03:45 pm	3.2. Closing Words & Open Networking End	

3.1 Opening Keynote

To foster a motivational environment for the creation of digital innovation, the hackathon kicked off with a welcome by Janina Sundermeier, Assistant Professor for digital entrepreneurship and diversity, and founder of the Digital Entrepreneurship Hub[3] and Hello Diversity! Studio[4]. This was followed by an opening keynote by Vera Schneevoigt, former Chief Digital Officer and Senior Vice President Engineering at Bosch Building Technologies. Vera shared her own experiences as a woman working in tech for more than 30 years, and highlighted how the percentage of women in those workforces has increased only slightly over time. She argued that the lack of women role models, who can inspire through their talent, education, and career path, is responsible for the comparatively low number of women in workforces involved in digital innovation. She herself has only seen infrastructures to address such gender inequality emerge in the last five years, such as mentoring, topic-related conferences, trainings, and women's empowerment groups. Apart from taking advantage of these initiatives, Vera advised women in tech to raise their voices.

> *"Speak up about your interest and what you need, how you want to work in the future, how we could support each other, integrate, and encourage each other. If you see that there is a public event with only male candidates, share this with the world through social media and propose*

[3] www.de-hub.org
[4] www.hellodiversity.digital

females. Provide male role models [for inclusion] with the platform they need, and give them the credit when they support women. Define ways on how to include men in this process towards gender equality."

Table 3. Speakers and Insights from the Panel Discussion

Panelists	Role	Observations, experiences, and topics addressed
Deborah Choi	Founder of horticure and Co-Founder Founderland	Gender equality is just one of many diversity dimensions for future workforces that need greater balance Visualizing the workforce of the future when exploiting digital innovation should incorporate the ideas, visions, and needs of the next generation An inclusive organizational culture that incorporates values from all employees is key to promoting gender equality
Vincent-Immanuel Herr	Founder of Herr & Speer, Author of Europe for Future, Feminist, Consultant, Ambassador 'HeForShe Germany'	Open communication among close confidants about workplace inequalities in digital innovation is critical to understanding experiences of unequal treatment in the workplace Remember that men can be feminists, too, and more should be included in the discussion of gender equality Spaces are needed to allow persons of all genders to openly discuss questions about feminism, women's quotas, and gender policies
Violeta Kameri	Corporate Culture Transformation Coach at BSH, Founder of Violeta Kameri Coaching	Establishing and maintaining a gender-diverse workforce is a company's social responsibility, but related initiatives are mainly supported by women Existing leadership systems are biased and limit women's potential in digital innovation Women's imposter syndrome – "an innate fear of being discovered as a fraud or non-deserving professional, despite their demonstrated talent and achievements" (Chrousos & Mentis, 2020) – is a big barrier Role models are a great source of inspiration for job-related decisions in digital innovation
Linda Oldenburg	Head of Consulting Business Resilience, Nortal AG	Organizational culture is the biggest barrier to achieving gender equality in the workplace Most businesses still lack a culture that supports gender equality in digital innovation Public discourses on gender equality tends to neglect small and medium-sized enterprises (SMEs) Gender equality in the workforce requires joint action by companies, policymakers, society, and individuals
Katarina Riechert	Corporate Culture Transformation Coach at BSH	People's attitudes and beliefs about gender equality are difficult to change because they have been formed over decades and often have their starting point in the child's socialization at home Employees are often reluctant to address gender equality issues in their companies for fear of a negative impact on their career advancement
Martin Speer	Founder of Herr & Speer, Author of Europe for Future, Feminist, Consultant, Ambassador 'HeForShe Germany'	Listening is key to understanding all parties' viewpoints, not only from a rational but also an emotional perspective Employers and employees should be given the opportunity to develop mutual understanding Political action is required to establish structures and policies on gender equality in digital innovation workforces by 2030

3.2 Morning Coffee Panel Discussion

The keynote was followed by a panel discussion – the 'Morning Coffee Panel Discussion'[5] – featuring six speakers that discussed a variety of questions and viewpoints, such as motivations to raise awareness about gender inequality in digital innovation, the greatest challenges they encountered while striving for gender equality, and visions for future workforce compositions and how to get there. An overview of the panelists and their main contributions can be found in Table 3. The panel was moderated by the founders of the co-working space CoWomen UG, Hannah Dahl and Sara-Marie Wiechmann Borges.

The **key takeaways** from the panel discussion in terms of what is critical for gender equality in workforces concerned with digital innovation are:

- **All genders should be engaged.** Various panelists emphasized that gender-related topics are often (unconsciously) associated only with women. Therefore, it is mainly women who initiate and participate in activities to advance gender equality in digital innovation processes and outcomes. While this is undoubtedly a crucial step forward, it overlooks the fact that all persons are 'affected' by gender (Annabi & Lebovitz, 2018; Dy et al., 2017), i.e., the social ascriptions associated with the gender they identify with, or their own ideas, perceptions, and stereotypes related to gender. Actual change can therefore only be achieved if the urgency for gender equality in workforces dealing with digital innovation is perceived by all stakeholders, regardless of their gender. This is seen as a key factor to ensure that there are advocates, supporters, and facilitators at all relevant organizational and political levels (see below).
- **Organizational culture is crucial**. Many organizations already have various strategic initiatives aimed at gender equality in their workforce (Annabi & Lebovitz, 2018). However, the panelists note that these are less fruitful if the core values and benefits of greater gender equality are not embraced and understood at all hierarchical levels. Otherwise, it would be just another "nice-to-have" initiative that is not really part of the DNA of the organizational culture.
- **Joint efforts by politics, society, companies, and individuals are required**. Gender equality in digital innovation is visible in the composition of the workforce, but calibrating conditions to embrace, achieve, and sustain gender equality requires a concerted effort not only from all types of companies, but also from policymakers, society, and influential individuals who champion the issue and act as role models for implementing strategies.

The insights from the panel discussions formed the basis for creative group work that was aimed at developing workable solutions to the challenges, and beyond, as outlined in the following.

3.3 Design Thinking Sessions

With the inspiration gained from the keynote and panel discussion, participants then began their creative group work on addressing the challenges around gender inequality in digital innovation that we had defined prior to the event. In total, we offered four key challenges with 13 subtopics that provided different perspectives on each challenge. The challenges were defined based on research findings on gender equality in the workplace, which we discussed along with the three theoretical perspectives outlined earlier (cscetion 2) with the conference committee, which then determined the 13 challenges. Each participant was asked to indicate preferences for up to three challenges when registering for the hackathon, which allowed us to form groups prior to the event. An overview of the challenges, and their embedding in the scientific literature, can be found in Table 4.

[5] A video recording of the panel discussion can be found here: https://www.youtube.com/watch?v=-VNvwbECyvc&t=2814s

Table 4. Key Challenges with Sub Challenges and Reference to Literature

Key Challenge 1: Incentivizing Workforce Equality	
The Business Case for Gender Equality: What business ideas could be developed that promote gender equality in the workforce involved in digital innovation and how is it possible to earn money by focusing on diversity?	Ahl, 2006; Trauth et al., 2018; Quesenberry & Trauth, 2012
(Business) Intelligence: What kind of numbers, data, and facts do revenue-driven organizations need as a justification to support gender equality in digital innovation processes?	Brush et al., 2019; Kanze et al., 2018; Gorbacheva, 2019
Equal Values: How do we bring more equal values into corporate culture and leadership?	Brush et al., 2019; Trauth et al., 2018
Life Balance: How can we learn from new work efforts enabled through digital innovation and thus create open corporate cultures that have been demanded by women for so long? How can we include men to tackle the challenges of the work-life balance that affect everyone?	Trauth et al., 2018; Annabi & Pels, 2016; Boell et al., 2013
Men and Gender Equality: How can organizations support men in familiarizing themselves with gender equality and feminist topics, and create safe spaces for men to talk about and tackle gender equality challenges?	Brush et al., 2019; Baskerville, 2007; Ahuja, 2002; Wilson, 2004
Key Challenge 2: Stereotypes and Discrimination	
Stereotypes: How can German Dax companies reduce stereotypes towards women as drivers for digital innovation?	Joecks et al., 2013; Meyer et al., 2017
Changing Work Culture Perceptions: How can we minimize gender-based discrimination? How may we involve people who do not face direct discrimination in their daily work, to support equal opportunities for all involved in digital innovation?	Armstrong et al., 2012; Trauth et al., 2018; Brush et al,. 2019; Robertson et al., 2001; Truman & Baroudi, 1994
Key Challenge 3: Support Infrastructures	
Changing Entrepreneurial Thinking: How can female entrepreneurial mindsets be promoted as drivers for digital innovation?	AbuJarour et al., 2019;
Broken Rung: How do we overcome the problem of the broken career ladder and keep women in companies (until they get into the lead)? What can companies do to reduce the (potential) waste of female talent?	Armstrong et al., 2012; Armstrong et al., 2018
Future Female Change Makers: How can we ensure that girls and boys equally benefit from, and are educated about, digital opportunities and career options?	Woolley, 2019; Craig, 2015; Trauth, 2017
Women in Leadership: What does it take for women in leadership positions to be successful in a company operating in a traditional male industry (e.g., IT)?	Cook & Glass, 2014; Olbrich et al., 2015
Key Challenge 4: Public and Private Stakeholder Involvement	
Government & Private Sector: What can they do to support gender equality in digital innovation and how can they support leadership training for women and men?	Brush et al., 2019; Smythe & Saunders, 2020; Craig, 2015; DuBow & Ashcraft, 2016;
Female Funding: How can investors, business angels and partners (etc.) be persuaded to invest their money, time and support in female founders?	Kanze et al., 2018; Buttner & Rosen, 1989

Various design thinking techniques were used to guide participants purposefully through brainstorming, designing, creating, and refining their (prototypical) solutions (Cross, 2011; Kotler & Rath, 1984; Camillus, 2008; Brown, 2009; Simon, 1996; Johansson-Sköldberg et al., 2013). In fact, "design thinking can be seen as a translation of designerly thinking into a popularized, management version" (Simon, 1996, p.4). This definition indicates that - despite its name - design thinking is used beyond the design context to foster creativity through a toolbox of methods (Brown, 2008; Brown & Wyatt, 2007; Johansson-Sköldberg et al., 2013). To this end, the hackathon consisted of three consecutive design thinking sessions, using MURAL[6], an online whiteboard tool for visual collaboration:

(1) *Understand:* The aim of the first session was to develop a more detailed understanding of the challenge that each team chose to tackle. The inspiration from the panel discussion and keynote speech were meant to motivate participants to search for solutions. This phase included an analysis of the challenge through identifying synonyms and looking at research and data available online and provided by us. In addition, the session involved team building exercises to establish the interconnection between the team members and distribute different roles within the group (e.g., timekeeper, presenter, facilitator, writer).

(2) *Ideate:* This session was all about ideation, i.e., the process of generating, developing, and testing ideas that may lead to solutions (Brown 2008). It therefore started with the creation of a stakeholder map highlighting the main parties affected by and/or contributing to the challenge chosen. On this basis, a persona canvas was created that provided detailed information about the behaviors and needs of each of the identified stakeholders. The session ended with a solution exercise during which the participants brainstormed ideas that could potentially solve the challenge tackled, while taking different stakeholder perspectives into consideration.

(3) *Cluster Ideas & Concept Creation:* The third and final session was about bundling and specifying the different solutions. All participants were asked to select up to three of their favorite solutions to facilitate the choice of a final solution for which the entire team would develop an initial prototype using materials they could find at home and/or technologies available to them. The session ended with the preparation of a three-minute presentation that included the problem, the (prototypical) solution, and a specification of the core function, features, and next steps after the event.

3.4 Pitch Presentation

The hackathon ended with the presentation of the pitches[7], which are typically a core component in the process of findings business partners, investors, and future team members that would support turning the prototypical solution into an actual product or service (Balachandra et al., 2019). The jury that accompanied the pitches consisted of diversity experts and managers, investors, and all speakers. The goal was to provide a stage for the participants and give them the opportunity to find mentors or investors, and get advice from experts so that they can continue to pursue their ideas purposefully after the event. In addition, the teams were able to win prices such as coaching and mentoring.

4 Theoretical and Practical Insights from the Hackathon

The overall aim of the hackathon was to build bridges between science and practice to facilitate the purposeful development of innovative solutions to current challenges related to gender inequality in the workforce in the context of digital innovation. The design and content of the hackathon were therefore influenced by both theoretical and practical insights that were continuously reflected throughout the entire event. This allowed for a critical discussion of research findings that point to, for example, the ineffectiveness of many diversity programs that are widely used in practice (Dobbin et al., 2015; Duguid & Thomas-Hunt, 2015). Research shows that, although these programs present a valuable step forward in achieving greater (gender) diversity in tech-related workforces, they are often designed to solve individual problems rather than to achieve organizational change (Wynn, 2019). As a result, most programs often replicate existing stereotypes that women have weaknesses that need to be fixed ("fix the women" approaches), rather than challenging and changing the organizational cultures ("fix the system" approaches), which are often defined by hierarchical and patriarchal ideas (Ahl, 2002; De Bruin et al. 2006; Hughes et al., 2012). Failing to take these insights into account leads executives to struggle in

[6] https://www.mural.co
[7] Some xemplary pitches can be found here https://bit.ly/hellodiversityyoutube

making "sense of inequality, understand its root causes, and work to change it, they employ discourses that legitimize, justify, and maintain the broader system of inequality (e.g., by reinforcing assumptions of ingrained gender differences)" (Wynn's 2019, p. 127). These examples show that we expected a fruitful exchange between theory and practice to support the targeted and meaningful development of innovation solutions for actual problems in digital innovation processes and outcomes. In the following, we describe in more detail the theoretical and practical relevance of the developed solutions and discuss future research opportunities arising as a result.

4.1 Key Challenge I: Incentivizing Workforce Equality

4.1.1 Theoretical and Practical Relevance

The first challenge, "Incentivizing Gender Equality in the Workforce", included five sub-challenges (see Table 4), all of which were driven by the idea of leveraging the economic, societal, and individual benefits that greater gender diversity would bring to digital innovation (workforces) (Trauth, 2011; Trauth et al., 2006). Existing research suggests that greater diversity in this regard improves team performance and problem-solving by broadening perspectives on digital innovation potentials that reflect the needs and desires of different potential customer groups (Gomez & Bernet, 2019), promote creativity while driving innovation (Forbes Insights, 2011), and increase employer attractiveness when competing for talents (Gomez & Bernet, 2019). Moreover, greater diversity is found to have positive performance outcomes as it fosters innovative learning environments (Herring, 2009). In addition to these economic advantages of incentivizing gender equality for companies, there are also various societal benefits: making it more attractive and easier for women to enter the thriving IT industry reduces the gender wage gap and opens opportunities for women's advancement in the workforce (Trauth & Howcroft, 2006; Annabi and Lebovitz, 2018). Some of the practitioners who participated in the hackathon reported that they agreed with the aforementioned research findings, but that communicating the benefits, implementing an organizational culture fostering diversity and inclusion that is equally embraced by the entire workforce, and making positive outcomes measurable so that they can be included as key performance indicators in employee goal setting is a major challenge. Similarly, Ahl (2006) argues that existing performance and growth measures fail to capture the benefits expected from greater gender diversity for organizational outcomes. In the following, we present some of the solutions that were (prototypically) developed during the hackathon and discuss future research opportunities on this basis.

4.1.2 Hackathon Ideas and Future Research Opportunities

One solution to incentivizing greater gender equality in digital innovation processes and outcomes involved a mobile application that enables a dialogue between employers and employees about gender equality.

- The mobile application 'EQYIP'[8] aims to connect all employees of a company through a platform that allows them to anonymously discuss their experiences and suggestions for advancing equality, without the fear of consequences. The app provides, as a first step, a company-wide social network to discuss gender equality in daily life, and later, a learning platform to educate all members of the organization on what is necessary to effectively address these needs, i.e., workshops, leadership training and 1:1 coaching. To ensure that all members are equally involved, a questionnaire on equality matters can be regularly distributed through the app.

The development of the app may be supported the diffusions of innovations theory (DOI) as it addresses the challenge of incentivizing the workforce to use this novel application (Rogers, 1962). In essence, the theory suggests that employees are only adopting to a new product, or in this case mobile application, if they find this innovative and new (Rogers, 1995; Mustonen-Ollila & Lyytinen, 2003; Weigel et al., 2014). Moreover, for a successful adoption process of the new innovation, the novel application has to be embedded in their social system, e.g., their workforce (Rogers, 1995; Mustonen-Ollila & Lyytinen, 2003). DOI describes various requirements for adopters: awareness to understand the need of this innovation, conscious decision to adopt, use of the innovation to try it out and test it, and most importantly, a continuous use of the innovation (Rogers, 1995). This theory may be a useful lens to accelerate the successful adoption of EQYIP. In addition, advances from Design Science Research (DSR) could support

[8] https://eqyip.wordpress.com

the purposeful development and evaluation of design requirements for inclusive mobile applications that create trust for users and are focused on incentivizing gender equality in the workplace.

Beside using DOI as a theoretical frame of reference to explain why users might (or not) adopt the previously described application, there are various additional angles rooted in IS-literature that would support the purposeful development and rollout of the app and provide opportunities for future research. For instance, analyzing the development from the perspective of self-determination theory (SDT) would allow to explore employees' motivation and self-initiated behavior to learn about gender equality through the app (Deci & Ryan, 2008; Greguras & Diefendorff, 2009; Olafsen et al., 2015; Rezvani et al., 2017). This theory suggests that people have three needs autonomy, competence, and relatedness, that are essential for their satisfaction, well-being and intrinsic and extrinsic motivation (Deci & Ryan, 2008). Those needs can be taken into account when building and implementing a mobile application for employees, to ensure that the app EQUIP will be motivating them to engage in gender equality discussions and learning experiences.

Nevertheless, research remains to be done as we currently have only limited understanding of inclusive innovations, incentivizing gender quality in the workplace, and a gender lens on mobile applications. Thus, this paper suggests future research opportunities that may enhance theory on the first key challenge:

- How can we measure inclusivity in digital learning platforms, such as gender equality mobile applications?
- What may be the barriers to and challenges of gender equality mobile applications in the workplace?
- To what extend do digital innovation business ideas such as mobile applications influence a more gender-equal workplace and how can this be measured?

Overall, these suggestions for future research may bring an understanding of a holistic approach using mobile applications for gender equality in the workforce. The related research opportunities provide a deeper understanding of equal values, equal work, and equal support within the workforce.

4.2 Key Challenge II: Stereotypes and Discrimination

4.2.1 Theoretical and Practical Relevance

Next, a large proportion of participants addressed the challenge "Stereotypes and Discrimination" that consisted of two sub-challenges (see Table 4). This challenge was motivated by recent findings in IS-literature indicating that gender stereotypes - defined as generalized perceptions about roles, characteristics, differences or attributes of a group based on their gender (Suseno & Abbott, 2021) - are still prevailing, in that entrepreneurship, digital innovation and tech-forces are associated with masculine characteristics, accounting for the comparably low number of women in tech in general and digital innovation processes in particular (Aleidi & Chandran, 2017; Gorbacheva, 2019; Joecks et al., 2013; Trauth et al., 2018). For example, the continued association of IT-related leadership positions with male characteristics has decisive implications in terms of who identifies with the role of a digital innovator (Sundermeier & Steenblock, 2022; Trauth et al., 2009; Trauth et al., 2016), and who receives the necessary resources to thrive in this role (Gorbacheva, 2019; Kanze et al., 2018). In fact, gender biases have their roots in socially ascribed attributes related to femininity and masculinity that align with societal perceptions of what is needed to successfully pursue digital innovation (Brush et al., 2019). For instance, Kanze et al. (2018) found that stereotypical thinking accounts for women facing discriminatory disadvantages during venture capital raising. This is because the investors see digital innovators and entrepreneurship as masculine activities, and thus favors masculine characteristics in the pitching process (Balachandra et al., 2013). In addition, gender and other forms of discrimination and stereotypes are found in the development and final implementation of IT-artifacts (Olbrich et al., 2015). However, greater diversity in the development of digital innovation leads to more inclusive products and services for a diverse consumer base, as the creators better understand customer needs from a wider range of perspectives (ibid). Trauth et al. (2018) suggest that more research is needed on the biases arising from algorithms that originate in the lack of representative data and human biases at the design-stage. These findings offer various opportunities to examine how gender stereotypes and biases could be addressed in digital innovation processes and outcomes.

4.2.2 Hackathon Ideas and Future Research Opportunities

Another solution aimed at promoting a more inclusive workforce that was developed during the hackathon is a digital equality certificate for companies, that could in the future be officially supported by legislation or policy measures:

- Companies may apply for the certificate "EQUALITY CERTIFIED", which will be provided after a detailed analysis of the status quo of a firm's investment in gender equality. To incentivize companies to foster their efforts and apply for the certificate, the Hackathon participants envisioned an annual government grant for companies developing gender equality. New workforce policies could foster equality, offer workshops (e.g., on gendered language, or on how to overcome stereotypes, etc.) or employee surveys about gender equality in the workplace. The advantages of such a certification, as highlighted by the hackathon group, would include: 1. an improvement of gender equality, integrity, and transparency in the workforce, 2. an enhanced public image of the company and employer branding, 3. championing of gender equality vis-à-vis other companies, the media and the general public.

The creation and implementation of such certificates may be supported and aspired to by research in IS that allows perspectives not only on the organizational, but also on an individual company level. On the organizational level, inclusive design is one perspective. Indeed, Trauth and her colleagues suggest four arguments that highlight the value and importance of inclusiveness (Trauth & Howcroft, 2006; Trauth et al., 2007; Trauth, 2011): innovation, consumer-focus, equality, and policy. The first argues that for workforces, the most important value is creative innovation by drawing on more diverse employee talent. The second argument highlights that the more diverse an innovation team is, the better it is placed to understand the diverse needs of a broader customer base, and thus be able to develop customized products and services, following the human-centered approach. The third argument emphasizes the notion of fairness, i.e., that everyone deserves the same possibilities and chances. The last argument stresses the idea that governmental regulations for creating a more diverse workforce will encourage companies and organizations to follow suit. Together, these four lines of argument should support addressing gender stereotypes and discrimination in the workforce and foster equality and diversity. Analyzing the equality certificate from an inclusion perspective in IS may bring insights on how to create a certificate that is social inclusive and thus able to address the gender imbalance in the workforce.

Moreover, taking the Individual Differences Theory of Gender and IT into account may enhance the development of company certificates not only on the organizational, but also on an individual level (Trauth, 2002; Trauth et al., 2004): In fact, this theory addresses not only group-level efforts, such as those from organizations, but also individuals. Thus, this theory explains gender variation in the workforce, and supports the gender intersectionality approach to investigate the underrepresentation of women in digital innovation. It also explains barriers and biases of women, which are perceived differently amongst women. Moreover, this theory takes structural and societal biases into account, thus providing a holistic view of organizations and individuals and may build a strong foundation for innovations such as equality certificates. In summary, this theory focuses on the sources of agency that resist biases and tackle the sources of biases, providing a better understanding of interventions, such as equality certificates, that can be implemented to address the barriers, discrimination and stereotypes that women are facing in the workforce.

Indeed, there is still much research work to be done as we currently have only limited understanding of how stereotypes and discrimination relate to gender equality in the workplace and whether and how equality measures can impact individuals. Thus, this paper suggests the following future research questions that may enhance theory on the second key challenge:

- How can measures such as equality certificates reduce gender stereotypes and discrimination for women in digital innovation?
- What is the impact of gender equality certificates on organizations?
- What effects might equality certificates have on individuals in terms of reducing barriers and enhancing workplace opportunities?

Research on these topics would provide a holistic view on gendered stereotypes and discrimination, and, specifically, on measures that can facilitate and remove obstacles to digital innovation and workplace equality.

4.3 Key Challenge III: Support Infrastructures

4.3.1 Theoretical and Practical Relevance

The third key challenge "Support Infrastructures" entails four sub-challenges (see Table 4). Over the past 20 years, IS researchers have analyzed equal opportunities in the IT workforce by focusing on institutional and societal infrastructures that support companies in overcoming inequalities (Trauth, 2017). Findings indicate that some infrastructure support can address gender imbalances. First, educational infrastructures within companies such as (STEM) courses for women or software training (Trauth & Connolly, 2022). These include academic female empowerment in science programs like *UN Women* or *l'Oréal-UNESCO For Women in Science* or certificates for academia that meet gender equality criteria (ibid). The aim of these programs is to encourage girls to get involved in digital innovation, science, technology, engineering, and maths subjects (STEM) (ibid). Next, societal infrastructures such as the availability of childcare and transport services have also been proven valuable (Trauth, 2017). A study conducted in Ireland by Trauth & Connolly (2022) showed that these infrastructures played a role in helping women return to work after maternity leave, thus enabling them to become one major component of Ireland's economic growth. Lastly, digital infrastructures like crowd funding or crowd sourcing platforms offer various opportunities for women as digital innovators (Suseno & Abbott, 2021). The advancement of such digital infrastructures and technology provides women with alternative funding options, while not relying on traditional venture capitalists, that are often biased to invest in women-led digital innovation businesses (Brush et al., 2008; Suseno & Abbott, 2021). Thus, digital infrastructures as such may disrupt barriers and serve as support infrastructures that provide more options for women entrepreneurs, giving them the same chances towards successful digital innovation as their male counterparts (Groza et al., 2020). In direct contrast with this view, Dy et al. (2017) suggest that the disadvantages associated with social gender positions tend to be reproduced in the digital innovation space, meaning that instead of digital innovation providing more opportunities for women entrepreneurs, they encounter disadvantages arising from biases or stereotypes about what the normative entrepreneur looks like (i.e., white and male) (Ogbor, 2000). Moreover, some infrastructures have been analyzed as being less effective in promoting an equal workforce. For instance, McAdam et al. (2019) challenges women-only networks, arguing that these are not directly suitable for male dominated workforces, because women prefer to engage among each other, rather than interacting with men and participating in, or challenging, the male-dominated entrepreneurial ecosystem. All in all, infrastructures can either encourage or discourage individuals interested in participating in workforces concerned with digital innovation (Trauth & Connolly, 2022). For example, parents, or a supportive teacher of a STEM subject, may actively encourage girls to start a career in digital innovation. Thus, support infrastructures should be designed to address the barriers and obstacles that women are facing when driving and exploring digital innovation (AbuJarour et al., 2019) to help create inclusive workplaces in which women may excel (Annabi & Lebovitz, 2018).

4.3.2 Hackathon Ideas and Future Research Opportunities

During the hackathon, participants developed various ideas for support infrastructures that could help to achieve greater gender equality in workforces concerned with digital innovation. One group focused on educational support infrastructures.

- The group's innovation is a consultancy called "BROKEN RUNG" which focuses on the broken career ladder to find solutions on how to ensure that women are supported during maternity leave. Practical examples of suggested ideas included flexible online training for women while they are on maternity leave, so that they are staying abreast of industry trends, and update their knowledge and continue to pursue career paths. Such training may be supported and certified by public or private partners, and be state-supported. In fact, recent research highlights the impact of online courses as a support infrastructure tool, to develop entrepreneurial mindsets to untap innovation potentials (AbuJarour et al., 2019).

In fact, this idea was critically discussed during the hackathon, as it assumes that women need to educate themselves during maternity leave if they want to stay connected with the workplace and maintain their career aspirations. This could be seen or experienced by women as an additional burden, despite their

family efforts and duties in their new role as a mother (or carer). As a result, it was discussed in the hackathon that such programs may only add to women's stress and frustration. In addition, it is essential to not only consider maternity, but also paternity leave. With rising paternity leave regulations and more and more dads taking time off for childcare, the infrastructures for them are needed just as much. A different and more positive angle on the development of programs that allow parents to stay in contact with their workplace may provide the example of Canada's "keep-in-touch" program. A new research study found that women who took part in the "keep-in-touch" program were more motivated and committed to their jobs (Hideg et al., 2018). Thus, the ability of taking parental leave without suffering promotion, pay, or leadership is essential for greater gender equality in the workplace and, moreover, for supporting all working parents - not just mothers - to achieve a better work-life balance.

The development of educational support infrastructures may be supported by educational intervention research that explore the effects of such infrastructures on retention in the tech workforce and on career choices (Quesenberry & Trauth, 2012). In addition, research by Ahuja (2002) that suggested a set of barriers to women in digital innovation, such as reconciling the tensions between work and family life, social aspects, e.g., self-efficacy, and structural aspects, e.g., the lack of role models and mentors, may be relevant when designing support infrastructures. Thus, the research conducted by Ahuja (2002) and Armstrong et al. (2018) on women and their choices in relation to a career in digital innovation may meaningfully inform the development and design of inclusive support infrastructures that reduce gender inequality in the workplace. For instance, firms could support women through mentoring programs or childcare support, or offer flexible working conditions for parents and paternity/maternity leave to facilitate the work-family conflict.

Building on this stream of research, Annabi & Lebovitz (2018) suggest that "for organizational interventions to be effective, they must be embedded in organizational onboarding and advancement procedures and policies, and target the unconscious biases in the organization at large to (1) reduce barriers and (2) improve retention (p. 1067)". Indeed, both argue that educational support infrastructures only affect individuals who actively participate in such programs. To impact gender equality in the workplace, it is essential to decipher the influence of support infrastructures on women's experience. Annabi & Lebovitz (2018) provide a tool in form of a framework that is based upon individual women's experiences, organizational support infrastructures and interventions, individual coping methods, and workplace barriers. In fact, their study provides an empirical investigation into gender diversity and inclusion interventions in IT and might also support with innovations such as the hackathon idea of the "Broken Rung". For instance, taking the framework's four building blocks into account when developing such innovation tools will lead to higher chances for women to use these support infrastructures more actively and thus stay engaged with their companies, with digital innovation more widely, and thus keep alive their career motivation, especially during maternity leave.

However, significantly more research work needs to be done to fill the gap on the currently limited understanding of, first, how to effectively encourage women to participate in online training and support infrastructures, and, second, of the impact of support infrastructures on women's engagement with and participation in digital innovation. Thus, this paper suggests future research opportunities that may enhance theory on the third key challenge:

- What is the role of gender in the design of support infrastructures of digital innovation?
- To what extent do support infrastructures influence women's career choices and values, and ultimately reduce the turnover of women in digital innovation?
- What kind of support infrastructures are effective at enhancing women's interaction with and participation in digital innovation, and how effective are they?

All in all, this research opportunity would create a more holistic view of how to enhance women's leadership and career positions through a theoretical gendered approach of support infrastructures to determine which measures should be implemented.

4.4 Key Challenge IV: Public and Private Stakeholder Involvement

4.4.1 Theoretical and Practical Relevance

The last key challenge, "Public and Private Stakeholder Involvement", which refers to stakeholders such as policy-makers, investors, suppliers, employees, customers, political groups, communities, and trade

associations, consists of two sub challenges (see Table 4). Indeed, Smythe & Saunders (2020) encourage public and private stakeholder involvement so that they can acknowledge and embrace the value of a more gender-equal workforce and what it brings to economy and society. To foster gender equality, it is essential for stakeholders to be proactive in a field where barriers are often exacerbated (Wheadon & Duval-Couetil, 2019). Moreover, Brush et al. (2019) highlight the central role that public and private stakeholders, like policy-makers and private sector organizations, can play to support entrepreneurship and workforces, in the form or, for example, local programs, government sponsored activities, and policies. In fact, policies and measures, such as legislation on gender discrimination or childcare services, may either enhance or discourage women's career development and opportunities in digital innovation (Trauth & Connolly, 2022). These efforts address gender inequality in the workforce and reflect EU-wide initiatives, such as the '30 Percent Club' movement, initiated by Germany in 2015, which requires 30 percent of supervisory and executive seats on company boards to be held by women (ibid). Ahl and Marlow (2012) took a closer look at government policies that encourage women's innovation processes, aimed at overcoming women's risk aversion, supporting the fulfillment of their personal potential and encouraging them to participate in social value creation. Included in this process are also female founders who are exploring and exploiting digital innovation (Schmitt et al., 2020). Other areas that require further research concerns the support for women beyond soft skills and empowerment, such as funding, time and resources provided by investors, partners, the government, and the private sector. In fact, only 2% of U.S. venture capital goes to female founders (Pitchbook & National Venture Capital Association, 2016), although they make up 40% of all private companies in the U.S. (Weeks, 2007). This paradox calls for attention, especially because research demonstrates a positive correlation between female founders and company performance (Kanze, 2018). In fact, studies have already documented a gender bias in fundraising processes and outcomes, in turn rooted in the lack of gender balance of decision-makers and whereas public and private stakeholder involvement during the fundraising process, may lead to more gender equality.

4.4.2 Hackathon Ideas and Future Research Opportunities

One solution to tackling public and private stakeholder involvement (including investors) was initiated during the hackathon by five women with the idea for an initiative that would bring greater transparency to investment and Venture Capital decisions.

- The mission behind "30over30[9]" is to set a target of at least 30% of women in decision-making positions in at least 30% of investment companies and banks in the DACH region (i.e., Germany, Austria and Switzerland). We already know that women startups receive much less investment than those run by men. However, who decides where the money flows and what proportion of women are currently in decision-making positions in investment firms? The 30over30 initiative aims to answer these questions and to increase the number of investments—and the amounts invested—in start-ups run by female founders and innovators. Since having developed this idea, the five hackathon group members have analyzed a total of 172 venture capital companies within the DACH region. The result is that only 12 companies (7%) currently have more than 30% women in decision-making positions. By constantly questioning the mission of gender equality and diversity, the 30over30 team seeks to further develop their understanding of equality and create greater awareness of inclusion and gender equality in workforces.

The development of public and private stakeholder involvement may be supported by stakeholder theory and be harnessed to enhance gender equality in the workforce by addressing a variety of stakeholder perspectives involved with digital innovation. For instance, stakeholder theory suggests that gender balance is directly correlated with the diversity of members on the board of directors, and with the board's independence (Bear, et al., 2010). Moreover, digital innovations focus on the ethical and social responsibilities of stakeholders (ibid). In addition, agency theory may be able to explain the relationship between public and private stakeholder involvement, and gender equality in the workplace. This theory is used to describe board composition and the functioning of organizations, and suggests that leaders often act in their own interest and at the expense of other stakeholders, for instance by prioritizing profit over social goals (Halliday et al., 2021). According to agency theory, leaders are appointed by people that want to ensure that their own interests are met, which often leads to female underrepresentation. Thus, this theory suggests that, as the choice of business model and strategy is mainly impacted by top-

[9] https://30over30.de

management, top-management is often responsible for gender inequality in the workforce. In essence, this theory finds explanations on a firm level for gender equality in the workplace and might suggest reasons for the low number of women in digital innovation (ibid).

This area, then, requires significantly more research to increase our understanding of stakeholder theory and agency theory by applying a gender lens, by investigating the role played by the visibility of investors, and to demonstrate how stakeholder involvement can improve gender equality in the workplace. Thus, this paper suggests future research opportunities that may enhance theory on the third key challenge:

- To what extent does gender equality of stakeholders influence diversity in digital innovation?
- How are the government and private sector supporting gender equality in the workplace, and increase the visibility of gender differences?
- What efforts in private and public stakeholder engagement are most effective in improving gender equality in the workplace?

Indeed, this research opportunity would create a more holistic view of how gender equality can be supported in the workplace, and increase our understanding of the impact of public and private stakeholder involvement through a gendered lens. With the hackathon project 30over30, the five project initiators have already started to increase transparency and awareness on gender equality to the venture capital ecosystem, through publications, statistics and white papers that reveal the stark reality of the number of women in decision making positions in venture capital firms. In the four months following the hackathon, while speaking to over 170 venture capital firms in the DACH region, they found that the low number of women in venture capital also reflects the low level of organizational commitment to diversity in these firms. It would appear that, at this moment in time, decision makers are not yet willing to fundamentally change their structures or processes.

4.5 Summary of Key Challenges and Solutions

Table 5 provides a summary of the key challenges, the existing barriers to gender equality in digital innovation, and related research opportunities. Our aim is to provide directions for a new era of investigation in gender and IS, and to support Information Systems researchers interested in exploring further the relationship between digital innovation and gender equality.

Table 5. Summary of Key Challenges and Solutions

Key Challenges	GE Barriers in Digital Innovation	Digital Innovation Solutions to Barriers, and Potential Research Topics
Incentivizing Workforce Equality	Business ideas Data and facts Equal values New work Men and GE	Solution: Gender equality app as an open platform. Research opportunities: • How can we measure inclusivity through digital learning platforms such as mobile applications that incentivize gender equality? • What are the barriers to mobile applications incentivizing gender equality in the workplace? • To what extent do digital innovation business ideas such as mobile applications help create a more gender equal workplace, and how can this be measured?
Stereotypes and Discrimination	Stereotypes in DAX companies Work culture perceptions	Solution: Digital equality certificate for companies. Research opportunities: • How do implementations of equality certificates reduce gender stereotypes and discrimination against women in digital innovation? • What is the impact of gender equality certificates on companies and individuals? • What effects might equality certificates have on individuals in terms of reducing barriers and enhancing workplace opportunities?
Support Infrastructures	Entrepreneurial mindsets Broken career ladder Future female changemakers	Solution: Training for women on maternity leave. Research opportunities: • What is the role of gender in support infrastructures surrounding digital innovation? • To what extent can support infrastructures influence women's career choices

	Women leaders	and values, and ultimately reduce the turnover of women in digital innovation? • What support infrastructures are needed to enhance women's interaction with and participation in digital innovation, and how effective are they?
Public and Private Stakeholder Involvement	Government & Private Sector	Solution: The '30over30' initiative aims to increase the percentage of female decision makers and leaders in VC to more than 30%.
	Funding of Women's ventures	Research opportunities: • To what extent does gender influence the perspectives and evaluations of digital innovation resource providers such as investors, partners, and business angels? • How are the government and private sector supporting gender equality in the workplace and increase the visibility of gender differences? • How can private and public stakeholder engagement be made more effective to increase gender equality in the workplace?

5 Conclusion and Outlook

It is undisputed that promoting gender equality in digital innovation has a wide range of positive economic and social impacts for companies, individuals, and society. Extensive empirical research has repeatedly shown that diverse teams are better suited to identifying digital innovation potentials (Wynn, 2019), perform complex tasks associated with its exploitation (Choi, 2002), foster team and financial performance (DuBrow, 2016), achieve firm growth (Eisenhardt & Schoonhoven, 1990; Hmieleski & Ensley, 2007), and design inclusive products and services, that are not biased and more accessible to customers (Olbrich et al., 2015). In addition, heterogenous workforces are found to diversify the range of digital innovation potentials identified and are more appealing to attract future top talents (Simard & Gammal, 2009). While these findings suggest that striving for greater gender equality in workforces in general, and in digital innovation in particular, should be a given, the goal is far from being achieved, with women making up less than a third of employees in tech-related workforces (Catalyst, 2022).

This report shows how digital event formats, which saw an unprecedented surge during the COVID-19 pandemic, can build bridges between science and practice to create meaningful solutions to societal challenges. To that end, we organized a digital hackathon attended by more than 150 participants in order to address challenges associated with workforce inequalities and develop solutions that reduce barriers and improve gender equality in job roles involved with digital innovation. This report describes in detail how students, practitioners, and scholars from very diverse backgrounds tackled 13 challenges on barriers of gender equality in the workplace, such as stereotypes and discrimination, incentivizing workforce equality, necessary support infrastructures, and the involvement of public and private stakeholders. The solutions they developed range from a mobile application to educating about gender equality, from online training for mothers to rejoin the workforce after maternity leave, to a digital equality certificate for companies. Nevertheless, the insights gained before, during, and after the hackathon indicate that a lot still remains to be done to address the lack of processes, organizational structures, and holistic knowledge on how to foster diversity and inclusion in digital innovation processes and outcomes. Questions for further research projects include - but are not limited to - various fields of research on four key challenges: incentivizing workforce equality, stereotypes and discrimination, support infrastructures, and public and private stakeholder involvement (see Table 5 for an overview).

A final question that remains for organizers of similar events that address gender issues is how to communicate the content and goals in a way that appeals to people of all genders. Events on issues such as gender inequality, stereotypical thinking, and discrimination continue to attract primarily women. Nevertheless, joint efforts are needed to address these challenges whose implications concern society as a whole. Further research should focus on this question, e.g., by experimenting with different marketing campaigns, to attract a more diverse audience, not only in terms of gender..

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