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**Building Gender-Transformative Innovation Ecosystems**  
**Supporting Women’s Entrepreneurship**

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\* The views expressed in this paper are those of the author and do not necessarily represent those of the United Nations.

## **UN Women CSW 67 Expert Group Paper**

October 10-13, 2022

Theme: Ensuring gender-responsive digital transformation

### **Building gender-transformative innovation ecosystems supporting women's entrepreneurship**

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#### **Context**

During the past two decades society has been experiencing an information and knowledge transformation as a result of the rapid development of Information and Communication Technologies (ICT). We are in the midst of a tectonic shift with new technologies emerging constantly, which have the potential to disrupt and influence all levels of society. This digital disruption requires a fundamental change in thinking for society, government, educators, and the business world. Starting and running a business in the digital economy of the 21<sup>st</sup> century requires at least a minimal level of 'digital entrepreneurship', comprising economic activities that may be carried out locally, regionally or globally via online or mobile platforms. Being able to harness the potential of this digital transformation is indeed a cornerstone of more inclusive economies.

At the turn of the century, the so-called digital divide was simply about the uneven distribution of access to the Internet, manifesting in exclusion and inequality because of socio-economic and social-cultural norms. Technological inventions were believed to be beyond women's capabilities (Eastin et al. 2015). This kind of digital divide is now referred to as first-level digital divide (Scheerder et al. 2017). With the arrival of high-speed broadband Internet and telephone connectivity, the focus of the digital divide discourse shifted to include a wider array of digital skills, or second-level digital divide. In the Fourth Industrial Revolution (4IR) – driven by ground-breaking technologies such as Artificial Intelligence (AI), Internet of Things (IoT), Blockchain and Virtual Reality (VR)– people who will reap the greatest benefits will be those able to adapt to the digital environment and have the digital literacy skills to navigate the online (business) environment (OECD, 2019).

Looking back a decade, the role of ICT in the digital economy – not only in terms of optimised production processes, but also in terms of information and knowledge management, product consumption, distribution and trade – appeared, a priori, to provide significant economic opportunities for women entrepreneurs (Braun, 2010). However, when it came to using digital technologies, there proved to be a glaring digital divide for women-led enterprises in terms of equal access to the internet and digital e-commerce platforms (Gurumurthy et al, 2019).

Disadvantages experienced by women entrepreneurs were not just attributable to a lack of local or regional access to technology and infrastructure, but also to a lack of knowledge economy skills, e.g., comprehensive digital and strategic skills to be able to conduct business in the

digital economy (Braun 2010; Van Deursen et al. 2016). This created a clear gendered order in technology, whereby offline bias was carried online, and women became frequently positioned as end users and men as primary innovators and designers (Marlow & McAdam 2015). It also created the wide-spread perception that women were under-represented in the technology sector which, in turn, triggered a range of government initiative to attract, promote and retain females to study IT and pursue technology careers (Bernhardt et al, 2018).

If digital technologies were flourishing before the global pandemic, life shifted exponentially onto digital platforms during lockdowns and social distancing. Teleworking, remote learning, teleconferencing, online health services, e-commerce and digital payments became de rigueur. With consumers shifting to online shopping, the rapid rise of e-commerce forced many enterprises to shift operations online to manage the demand for goods and services (OECD, 2019). In fact, during these tumultuous times, enterprises had little choice but to pivot their business models in a bid to survive in the ‘new normal’, reduce risk and seize new opportunities (Manolova et al., 2020).

Business model adaptation was particularly challenging for women entrepreneurs with enterprises commonly concentrated in traditional women’s sectors such as agriculture, tourism, food, and accommodation services, which were most severely affected by the economic downturn. Moreover, today’s digital business climate requires digital literacy comprising meta-competencies ranging from digital know-how, to understanding business models, negotiation and communication skills (Braun, 2010). E-commerce carries a higher risk of dropping out for women, who tend to hold lower digital skills and have less free time to engage in online activities due to disproportionate household responsibilities (OECD, 2020). Especially for women-led micro and small and medium-sized enterprises (MSME) and informal enterprises in developing countries, pivoting to an e-commerce model proved next to impossible due to lack of ICT literacy, stable internet access, e-business skills, and e-payment capabilities, within both their own enterprises and their entrepreneurial ecosystems (ITC, 2020).

## **Entrepreneurial and Innovation Ecosystems**

Opportunities to remain resilient and thrive as an enterprise depend on the economic and social environment within which women entrepreneurs operate, as well as the government policies and programmes that enable inclusive development (Kuckerz & Brändle, 2021). The support structure for entrepreneurship – often theorised as the ‘entrepreneurial ecosystem’ or ‘innovation ecosystem’ – creates the environment for enterprise emergence and growth.

Entrepreneurial ecosystems provide a useful conceptual framework to foster economic development via entrepreneurship. The World Economic Forum (WEF) identified entrepreneurial ecosystems as comprising eight pillars: accessible markets, human capital/workforce, funding and finance, support systems/mentors, government and regulatory framework, education and training, cultural support, and universities as catalysts for innovation and small business growth (WEF, 2013). A conducive culture is needed for an entrepreneurial ecosystem, which includes availability of appropriate finance for entrepreneurial start-ups, quality human capital, markets, and a range of institutional supports, enabling policies and leadership (Isenberg, 2011). The geographic boundaries of an ecosystem can be as narrow as a city and as broad as a country or a region.

Innovation ecosystems, a concept that has been popular for over 15 years, similarly comprise a range of actors, including universities, government, corporations, start-up accelerators,

venture capitalists, private investors, foundations, entrepreneurs, mentors, and the media (Adner, 2006). Each plays a significant role in creating value in the larger ecosystem by transforming new ideas into reality, generally through financial investment. Actors in innovation ecosystems form a community that supports one another through collaboration, sharing of values and resources. Collaboration creates an active flow of information sharing and knowledge transfer to solve real-world issues for innovators and entrepreneurs, who generate value for the region by building new technologies and creating jobs. Some innovation ecosystems have a strong focus on emerging technologies in areas such as AI and VR, as is the case in the well-known Silicon Valley region (Granstrand & Holgersson, 2020).

### **Government Policy in Innovation Ecosystems**

Government policy is seen as an important pillar to build a strong innovation ecosystem, performing a helpful role in stimulating enterprise development and regional innovation. Ecosystem policy is always contextual and hence embedded in the social, cultural and political institutions of its environment (Yousafzai et al. 2015). The institutional environment in turn influences entrepreneurial activity and firms' resulting trajectories (Bruton et al. 2010).

Women's participation in the digital economy is predicated on an ecosystem approach. There is a well-established body of literature on how well entrepreneurial ecosystem policies support women-led enterprises (Braun, 2018; Brush et al. 2019; Foss et al, 2019; Orser et al. 2019). While in theory all entrepreneurs benefit equally from resources within the ecosystem, this is often not the case (Brush et al. 2019). Indeed, research has shown that entrepreneurial ecosystems do not support female entrepreneurs to the extent they support male entrepreneurs (Brush et al. 2019; Eversole et al. 2019). Australian ecosystem policies, for example, were found to be both inadequate and gender-insensitive, under-supporting the female entrepreneurship pipeline (Braun et al, 2021). Without paying heed to gender, ecosystem policies perpetuate systemic discrimination of women-led enterprises (Ahl, 2006).

While women-led enterprises are not intrinsically less productive, an inherent gender bias obstructs female entrepreneurs from equal access to ecosystem resources such as finance and markets, preventing them from reaching their full potential (Ahl 2006; Bosse & Porcher 2012). Gender and international trade research similarly points to the role of government and weak collaboration within ecosystems in deterring women entrepreneurs from equal access to ecosystem pillars, which negatively impact the international trade status of women (Braun, 2018; Orser et al, 2019). Despite good intentions to evolve public-private and inter-agency collaboration within innovation ecosystems, the gap between demand and supply of gendered support appears ever harder to bridge. This is further reinforced by budget restraints and the misconception that gender-neutral support can adequately serve all would-be entrepreneurs. As a result, women entrepreneurs, and especially younger generation women entrepreneurs, tend to go it alone.

To date, there is little empirical evidence that contemporary entrepreneurship policies address gender gaps to increase women's participation in the economic mainstream (Henry et al., 2017). Nor do calls for inclusive economic development appear to be heeded to achieve the SDG agenda (Akman et al 2017). Researchers across the globe agree that women's entrepreneurship policies are not sufficiently underpinned by knowledge and a framework that engage and support enterprising women within their innovation ecosystems, making policies both gender-unresponsive and ineffective (OECD 2021). It also ignores the fact that women-led (M)SMEs, including women-led IT companies are, now more than ever, a growth sector.

This is not to say that there haven't been multiple attempts at introducing policies and programmes that help women overcome barriers to become nascent entrepreneurs or enter the IT field. To the contrary. For years, individual countries and entire trade regions such as the European Union (EU) and Asia-Pacific Economic Cooperation (APEC) have designed both systemic and ad hoc policy interventions to augment women's participation in entrepreneurship and the technology sector to encourage women to play a more active role in the digital economy. Given the historical bias against women in entrepreneurship and IT careers, it was inherently logical to tackle these issues through a gender lens (Bernhardt et al, 2018).

What is less logical is when policies and initiatives, often designed without meaningful stakeholder input, continue to be rolled out in one form or another without discernible impact. For examples, despite decades of well-intentioned work by organisations, activists, and advocates to tackle low participation of women in STEM – comprising everything from career days, computer clubs, role modelling, mentoring and coaching to general promotional events and more – increasing the number of women in IT remains elusive. Yet belief in the value of these programs persists (Quiros et al, 2018).

Perhaps part of the confusion and blurring of the lines is the lack of differentiation between 'hard' or 'core' and 'soft' IT skills, between 'building' and 'using' IT, e.g., women wishing to become coders, systems architects, or wireless network analysts vs. women starting an ICT-enabled business or women adopting and using technology while working in an IT or other company setting. Well before, and increasingly since the start of the pandemic, there has been a remarkable increase of young, 'digital native' women entrepreneurs – in contrast to older generations of 'digital immigrant' women entrepreneurs with lower or no digital skills – who use technology and digital communication tools for sales, marketing and security for their small legal, retail, accounting or fashion business (Spender, 2014). These young women entrepreneurs may not have formal IT qualifications, but they are likely to have a university degree and will have proactively sought out ICT-related courses on, for example, how to get the best out of a website or social media. The fact that these young women aren't classified as IT workers with start-up businesses, is more a reflection of laggard cultural norms than their occupation, skills and attitudes (Bernhardt et al, 2018). These women entrepreneurs of the 21st century have fearlessly entered a transformed digital marketplace, where there is much less entrenched power. While they are managing on their own, they would – as would all entrepreneurs – benefit immensely from operating within a gender-responsive innovation ecosystem.

When looking at the perceived 'problem' of recruitment, promotion, and retention of women in technology fields, a gender-responsive ecosystem might, for example, wish to refocus the gender lens from a societal 'need' to an individual choice young women make about which career they most wish to pursue. The latter may, in part, be influenced by the (lack of) information they receive at a young age on what possible directions a career in IT could take. As such, recruitment and retention issues are not about 'fixing' women alone, but rather about transforming conventional print-focused curricula into digital-focused ones. This shift would widen interest in ICT-based career options, and make coding the norm from kindergarten, as exemplified by some progressive Asian economies. It requires a new breed of teachers for whom IT is a way of life, not just another subject. Most importantly, it requires transformative thinking by all actors within innovation ecosystems (Bernhardt et al, 2018).

## Policy Recommendations

To this day women entrepreneurs continue to lag in their ability, skills and confidence levels to access, use and afford digital tools. This ongoing digital divide, affecting women of all ages and across international boundaries, has many underlying causes, which are deeply rooted in society. Causes include affordability of access to digital technologies; lack of or low digital literacy on poorer socio-economic levels; time poverty which hinders studying and in turn leads to less confident use of digital technologies; and security and safety concerns due to inherent biases and social norms (Gurumurthy et al, 2019). These causes are often interrelated and affect each other. Women also continue to face cultural barriers and stereotyping, reinforcing existing digital divide gaps and limiting women's engagement in e-commerce (OECD, 2019).

When transforming innovation ecosystems and creating gender-responsive processes throughout ecosystems, it is essential to think beyond access to technology and technical skills. While the latter two are hugely important and still vastly unequal in both developed and developing ecosystems, technology is not an isolated artefact but rather an enabler within the innovation ecosystem (Braun, 2018). Targeted policies can enhance gender inclusion and women's capabilities to successfully conduct digital entrepreneurship within a supportive enabling environment.

**Build a gender-transformative innovation ecosystem framework** to unlock the potential of women on all levels. Provide holistic gender-responsive supports that build entrepreneurial capacity and strengthen the digital talent-pipeline of women entrepreneurs. Collaboration, coordination and communication between agencies and other forms of partnership attention to gender integration are key processes for the transformation of both local and global ecosystems.

**Adopt an inclusive systems thinking/action research lens** to regularly monitor, evaluate, measure – through the collection of sex-disaggregated data – and adapt as needed women entrepreneurs' integration across all pillars of the gender-transformative innovation ecosystem, including but not limited to access to (IT) infrastructure, digital literacy skills, e-markets, finance and investment resources, and opportunities such as public procurement.

**Design place-based, contextual (e-platform) solutions and supports** that acknowledge women entrepreneurs are a heterogeneous group, located across widely differing geographic locations and innovation ecosystems, with widely varying resource, support, digital access and education needs.

**Re-evaluate IT/STEM programmes and school curricula for impact.** Respect women's individual career choice. Transform national education curricula still saturated in print skills into 'digital curricula', consider starting coding at kindergarten level to engage both female and male students early in IT, and prepare them for a digital career, workplace and society.

## Conclusion

Embracing new technologies is about recognising that we live in an era of disruptive technologies that require a tectonic shift in thinking for all. These technologies will empower the individual in ways we cannot predict. Already we have seen social media playing a leading role as a powerful influencer. In our ever-changing digital environment everyone is a learner as technology will continue to evolve rapidly. It is more a matter of keeping up with the new than learning the old. The secret to success is adaptation and awareness of potential pitfalls of the digital playing field. E-commerce platforms, for example, often touted as the great equaliser for e-commerce merchants, have not turned out to be a level playing field for all who work and operate within it, with technology-challenged women entrepreneurs especially at risk (Gurumurthy et al, 2019).

While e-commerce evokes images of women's empowerment and opportunity, the digital divide remains gendered both on- and offline, especially in emerging economies, where women still face socio-cultural barriers and stereotyping and where their lack of access to information, education, and technical skills mirrors their access to entrepreneurial opportunities (ITC, 2020). Building gender-transformative innovation ecosystems has the potential to enable all women entrepreneurs to join the digital economy.

Since women's participation in the digital economy is predicated on an inclusive ecosystem approach, weak ecosystem supports for women entrepreneurs negatively affects their confidence in e-commerce participation as well as their competitiveness. Designing for transformation, policymakers would do well to consider that innovation ecosystems are indeed gendered, and that phenomenon has spilled over into systemic 'e-commerce' inequality. Targeted policies and supports that enable digital literacy and e-commerce opportunities for all prevent obstacles women have encountered in the analogue world from growing exponentially in our digital future.

Policies that take a holistic framework approach are pivotal to unlocking the potential of female entrepreneurs, whereby ecosystem actors working closely together – with each actor making a unique contribution to the digital, entrepreneurial, regulatory, e-trade and training landscape – can achieve transformative innovation ecosystems.

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