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Women and Leadership in the ASEAN Digital Economy: Mapping the Rhetorical Landscape*

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Abstract: *This paper assesses the nature of policy, media, and research representations of women's inequality in digital leadership, reflecting on how clearly they define the issues, causes, solutions, and resource needs. Overall, women's status in digital leadership receives patchy coverage in the media and insufficient depth of examination in academic and policy research. Existing rhetoric recognises women's inequality as a serious problem in the ASEAN digital economy. However, the dimensions, causes, and solutions especially in terms of digital leadership are rarely clearly defined. There is a dominance of economic narratives to support the need for more women in digital leadership, which demonstrates a higher interest in women as an engine of economic growth than in equal representation as a matter of principle. A heavy dependence on global, European, or North American data highlights the need to improve the collection of gender-disaggregated data within the ASEAN economy.*

Keywords: Women economic empowerment; Digital gender divide; Digital economy; Women in STEM; Women in leadership; Media coverage

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1. Introduction

This paper explores the perceptions of the status of women's leadership in the digital economy in the 10 Member States of the Association of Southeast Asian Nations (ASEAN) – Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam. It builds upon earlier research by Sey (2021), which found that although ASEAN Member States have made high-level commitments to gender digital equality and to lead the region in equal digital access, there are still significant challenges to women's advancement in digital leadership.[1] Recent analyses by UN Women and ASEAN Cambodia (2022) confirms the persistent gender gap in managerial positions (especially middle- and top-management), showing that in the past 2 decades, the share of women managers in Southeast Asia has increased by only 2% (from 39% in 2000 to 41% in 2020). In view of the seeming intractability of gender-based inequality in economic leadership in general, it remains to be seen what ASEAN policy measures will bring about the desired levels of improvement in digital leadership specifically.

Defining a problem – that is, mapping out the symptoms and causes of an issue – is a key element of the policy decision-making process and has a critical impact on the development of policy solutions and efficacy of policy implementation. This is especially true with complex issues, such as gender equality, which have multiple dimensions and interactions. Blume (n.d.: 6) viewed such issues as ill-structured constellations of well-structured problems and proposed that breaking down these problems – to 'disentangle as many problems as possible into a set of clearly defined problems' – can help identify amenable aspects to policy intervention.

A well-structured problem has (i) one or a few policymakers who have jurisdiction over the issue, (ii) relatively bounded policy options, (iii) a consensus around the problem and its symptoms (although causes may be contested), and (iv) outcomes that can be projected with some certainty. A clearly defined problem is easily understood by decision-makers and affected stakeholders, facilitates identification of pathways to policy impact (including resource needs), and signals impact evaluation criteria (Blume, n.d.).

[1] Digital leadership refers to participation in the digital economy in leadership capacities such as management positions, entrepreneurship, and technology policymaking.

This paper assesses the nature of policy, media, and research representations of women's inequality in digital leadership, reflecting on how clearly they define the issues, causes, solutions, and resource needs. The extent to which stakeholders define and communicate well-structured problems influences how easily the problems are understood and addressed. By examining the nature of rhetoric about women in the digital economy, this paper seeks to advance policy-oriented research beyond repeating already-established realities about gender digital inequality. This can help better explain why the problem persists, despite decades of discussions and proposals on how to address it.

One can deduce how a problem is defined by examining the language used to describe it in public policy conversations as well as in the public sphere. In the context of gender-based inequality in digital leadership, information from policymakers and digital industry officials can highlight the perspectives of the actors most directly involved in creating and implementing policies to address the issue. Media and research institutions also play roles by generating and communicating knowledge about public policy issues.

Media institutions, through their agenda-setting functions (Howland, Becker, Prelli, 2006; McCombs and Valenzuela, 2020), have the ability to generate public support for or concern about issues, which in turn can drive policy action and shape policymaking processes (Soroka et al., 2013). They do this through the quantity, nature, and content of the topics that they cover. The media can also serve an investigative function by monitoring and reporting on the status of policy implementation. Policymakers often pay more attention to problems when they are covered extensively by the media. Examining how the media in the ASEAN region covers issues of women in the digital economy can thus provide insight into how the public and policymakers perceive the issue.

Academic and technical policy or policy-oriented research and analysis also inform policymakers' decisions directly and indirectly. They provide evidence on the nature of social issues and options to address them. Although it is difficult to connect research outputs to the policymaking process (Dale, 2011; Weiss, 1979; Young, 2011), examining how scholarly, think tank, and civil society research outputs frame the problem of women's unequal status in the digital economy can also shed light on the

empirical and conceptual information that policymakers may be drawing on for their decision-making.

This analysis is framed by Blume's (n.d.) policy analysis framework, which provides a lens to assess whether gender digital equality is currently a policy, implementation, or management problem – and how this affects the appropriateness and/or effectiveness of proposed solutions. For any given problem that receives policy attention, addressing the issue has at least three overlapping elements – the development of policies targeted at the problem, implementation of the policies by relevant institutions, and management of the outcomes of the policy. An issue is a policy problem when policies need to be developed to address it; it is an implementation problem when policies are in place but problems exist with how they are being implemented; and it is a management problem when the implementation or results of a policy are affected by internal and/or external institutional factors (Blume, n.d.). A policy problem affects the public directly (e.g. a low proportion of women in technology management positions), while implementation or management problems affect the public indirectly due to how the implementing organisation or the policy itself performs (e.g. inconsistent collection of mandatory gender-disaggregated data by implementing agencies, or irregular reporting of gender-disaggregated data by technology firms).

2. Methodology

Framed by the above considerations, two methods were used to gauge how the problem of women's inequality in digital leadership is defined by media, academic, policy, and industry actors. Only English-language media articles and literature were reviewed. Note was taken of the following:

(i) how these framing narratives presented their views of gender equality in digital leadership,

(ii) causes attributed to the state of gender equality,

(iii) solutions and related resource needs proposed,

(iv) stakeholders mentioned as responsible for implementing solutions, and

(v) examples of initiatives mentioned.

Analysis consisted of interpreting the narratives in relation to how clearly a problem was identified; what values that they seemed to imply; and whether there was a logical connection amongst problems, causes, and solutions.

2.1. ASEAN Member State Media Reports, 2020–2022

News articles were identified primarily on the LexisNexis data platform and, to a lesser extent, through Google searches using keywords such as gender, women, digital economy, leadership, equality, entrepreneurship, ASEAN, and individual ASEAN Member States. This generated over 370 potentially relevant articles on the digital economy. The articles were reviewed and ranked for relevance, revealing that less than 10% (i.e. 30 articles) addressed the topic of women and leadership. The 30 articles were then coded to identify how the issue was covered by the media.

2.2 Literature on Women's Leadership in the Digital Economy, 2020–2022

Literature was identified primarily through Google and Google Scholar searches. The search generated over 120 articles and reports, from less than 1 page to over 100 pages. Screening of abstracts and executive summaries indicated that there were very few documents that focussed on women and leadership in the ASEAN digital economy. The review therefore attempted to glean whatever limited elements of this topic could be identified within the documents. In documents that were mostly about the digital economy, this was done by searching for portions that mentioned gender or women. In documents that were mostly about gender, this was done by searching for portions that mentioned the digital economy.

3. Rhetorical Landscape

The results show that research and media coverage of women's leadership in the ASEAN digital economy communicate a clear concern about gender-based inequality but with vague definitions of the problem in the digital context and with respect to leadership.

3.1. Existing Rhetoric

Overall, while the general problem of gender-based digital inequality is recognised, the specifics – as they relate to the ASEAN economy and digital leadership – are not clearly defined. Across the board, in the literature and media,

there is limited elaboration of the state of women's equality in digital leadership, specifically in the ASEAN economy. Most narratives present generic discussions of the digital economy, with incidental references to women as an example of a vulnerable, underserved, marginalised, or disadvantaged population. For example, 'ILO (2016) estimates that 57 % of the Cambodian workforce (over 4 million workers) face a high likelihood of automation affecting their jobs, with low-skilled workers, women, youth and less educated workers being more at risk' (te Velde et al., 2020: 29). In instances where the problem was somewhat defined, it tends to be implicit rather than explicitly stated, meaning one must make assumptions about what the problem is. Nevertheless, some relevant indications can be deduced from the narratives by making inferences from the contexts in which gender or women were mentioned.

The co-chairs' summary of the 33rd ASEAN–Australia Forum, in another instance, contained one paragraph on the importance of strengthening the digital economy that, amongst other objectives, acknowledged efforts to 'bridge the divide for women's access to and meaningful participation in the digital economy' (ASEAN, 2021). A previous paragraph noted the negative outcomes of the COVID-19 pandemic on gender equality and recognised the 'central role for women in regional recovery efforts' as well as 'the importance of increasing women's economic participation and empowerment' (ASEAN, 2021). It also referenced some initiatives that are symptomatic of efforts to address these problems, such as the ASEAN Smart Cities Network, ASEAN Sustainable Urbanisation Strategy, and the ASEAN–Australia Digital Trade Standards Initiative. Five problems were implied in the above statements:

(i) The ASEAN digital economy is not strong enough.

(ii) There are too few women participating meaningfully in the digital economy.

(iii) The COVID-19 pandemic has worsened gender equality.

(iv) The COVID-19 pandemic has worsened the ASEAN economy.

(v) There are too few women empowered and participating in the economy.

Of these, the second most clearly defines a problem in terms of gender and digital leadership, although it was still vaguely expressed. Some of the initiatives referenced include more specific commitments and intentions to promote gender equality; however, they are mostly unrelated to digital leadership. Others do not directly address

the issue at all. For example, the ASEAN Sustainable Urbanisation Strategy noted the higher risk of automation of jobs held by women and the relatively low proportion of female computer science graduates and researchers in the ASEAN region (ASEAN, 2018). Moreover, the ASEAN–Australia Digital Trade Standards Initiative had only one reference to gender (Standards Australia, 2018).

The tendency to discuss gender inequality in association with multiple other – usually economic – problems is common across media, research, and policy content. Such vagueness or the combination of multiple problems has implications for what ends up being seen as the core problem and consequently how it is addressed. It can also result in mismatches between the problem and solutions implemented to address it. For example, while the ASEAN Sustainable Urbanisation Strategy identified the challenges of women's jobs being susceptible to automation and gender inequality in STEM[2] education (Table 1), it is not clear that the prioritised action (i.e. a bootcamp) will solve the problem – especially since the bootcamp model has been found to mostly provide training in skills for entry-level positions and tasks that are also susceptible to automation (Garrido and Sey, 2016).

Table 1: Sample Social Inclusiveness Agenda of ASEAN Sustainable Urbanisation Strategy

Sub-area	Prioritised Action	Challenges	Opportunities
Education	Develop digital skills through 'industry boot camps'	In the Philippines and Viet Nam, women are twice as likely to occupy jobs at high risk of automation as males. In Indonesia and Thailand, they are 1.5 times more likely. Only 34% of computer science undergraduates in ASEAN are women.	Equip the ASEAN workforce, particularly women, with the digital skills that they need to secure future employment.

ASEAN = Association of Southeast Asian Nations.
Source: ASEAN (2018: 59).

[2] Science, technology, engineering, and mathematics.

An example of a more clearly defined problem is in an article covering an event on bias in artificial intelligence (AI), which stated, '[O]nly 22% of AI professionals globally are women…companies hiring experts for AI and data science jobs estimate fewer than 1% of the applications they receive come from women…Women and girls are 4 times less likely to know how to programme computers' (UNESCO, 2021). The article focussed on the issue of too few women in AI professions, noting related issues, such as the low number of women submitting applications for AI jobs, lower programming skills of women, women's lower likelihood of filing for technology patents and holding leadership positions in technology firms, and the lack of mentors and female role models for women and girls. The clarity of focus on this specific aspect of women's unequal status in the digital economy allows easier identification of causes and potential solutions. Notably, however, supporting data for the problem definition are not specifically about ASEAN Member States.

These observed rhetorical trends can be partly due to 'at the regional level, a focus on digital gender equality is only very recent' (Curtis et al., 2022: 11). Often, assertions of gender-based digital inequality – especially in leadership – are supported with descriptions and data from other world regions such as Europe or North America. ASEAN Member State data, when cited, typically relate to digital access, with very few – or fairly outdated – figures on digital skills, STEM education, or digital leadership. The reader thus comes away either assuming that the gender digital inequality problem in ASEAN Member States is the same as in other parts of the world or has a fuzzy picture of the shape and magnitude of the problem in the ASEAN region.

Economic arguments dominate calls for gender digital equality; ethical or equity-based arguments do occur but less frequently. Economic perspectives are the most prevalent in the research literature and usually focus on e-commerce as having the potential to support women-run micro, small, or medium-sized enterprises (SMEs) to facilitate digital integration in the region. Similarly, news articles largely approach gender equality in the digital economy from the perspective of post-COVID economic recovery. Overwhelmingly, the development values most frequently expressed in the literature and media tend to align with Sustainable Development Goal (SDG) 9 on Industry, Innovation, and Infrastructure, followed by SDG 8 on Decent Work and Economic Growth and SDG 5 on Gender Equality. Again, by process of induction,

these economic perspectives can be translated into a variety of problem statements, all somewhat conveying that women's unequal digital status is detrimental to the national economy:

(i) Nations have an economic growth problem (e.g. for post-pandemic recovery), and the solution is to increase female labour force participation via the digital economy.

(ii) Companies and industries have a market growth/expansion problem, and the solution is to increase women's access to markets and purchasing power via digital technologies and financial inclusion.

(iii) Women entrepreneurs have a business development problem, and the solution is to improve women's access to and use of digital technology.

(iv) Women have a workforce participation problem due to their domestic responsibilities, and the solution is to make it possible for them to take advantage of the flexible work options that digital technologies enable.

(v) Women have a digital economy participation problem due to low digital access; poor digital, STEM, or business skills; and negative industry/social norms; and the solution is to improve their access and skills and to remove barriers that prevent women from aspiring to or holding leadership positions in the digital economy.

Notably, the first two problem statements imply that including women in the digital economy is a solution to a broader economic problem; the third and fourth statements imply that digital technologies are the solution to women's economic problems; while the fifth statement implies that structural change is the solution to women's problems participating in the digital economy. Statement 5 is most pertinent to women's leadership in the digital economy but appears less frequently in the literature.

The prioritisation of economic perspectives promotes the artificial distinction between productive and reproductive activities that reinforces gender roles and the double-bind faced by women in employment. For example, in statement 4 above, the suggestion that digital technologies would enable women to balance domestic responsibilities with employment or entrepreneurship implies that the goal is to provide a means for women to fulfil expectations about their domestic roles and

simultaneously be ‘economically’ productive. This neglects other possible solutions such as promoting more equitable distribution of domestic and care work.

Social justice and equity perspectives create four types of arguments:

(i) Gender digital equality is a human right.

(ii) Women’s empowerment to participate in the digital economy is simply the right thing to do.

(iii) Women’s equal participation in the digital economy would enable the industry to create products that meet women’s needs.

(iv) Developments in the digital economy pose a threat to women’s economic and social participation.

These perspectives are found infrequently and often appear as auxiliary comments in a mostly economic argument. Essentially, their definition of the problem is that women’s unequal digital status is fundamentally detrimental to women’s well-being and possibly society at large, whether due to potential job losses from automation, lacking the skills to participate at leadership levels, unequal pay, the production of goods and services designed from a male perspective, or risks to their safety and security. They argue for diversity and inclusivity as important values irrespective of economic factors. For example, te Velde et al. (2020: iv), noting the risk of automation to women in the garment industry, stated that ‘Cambodia’s digital transformation is gathering pace but with different results and prospects across different groups in the economy’. Similarly, Marsan and Ruddy (2020) stated that ‘the transition towards the digital economy must be inclusive. … Post-pandemic ASEAN must bridge the digital gender divide’. Commenting on digital labour platforms in South-East Asia, Trajano (2021: 5) called for a ‘human-centred framework’ that

> entails providing social protection benefits even to those in web-based digital labour based on the principles of solidarity and risk sharing. Technology-enabled future of work needs to have gender equality measures that advance women’s voice and leadership, eliminating violence and harassment at work, and implementing pay transparency policies.

As with the economic perspective, the solutions associated with social justice and equity are not always aligned with the problem. For example, discussing COVID-19 pandemic impacts on the garment industry, Banga and te Velde (2020) identified

challenges for women, including job losses, increased burdens of unpaid care work, risks of gender-based violence, and reduction in access to support services. Their two potentially gender-relevant recommendations included 'revise and extend social protection mechanisms to the most vulnerable, who are most at risk of losing their jobs owing to the pandemic' (Banga and te Velde, 2020: 11). While this recommendation is more social structure-oriented than the typical infrastructure or training-oriented solutions, it is still relatively vague, and it is possible that social protection mechanisms will focus more on the economic than socio-cultural dimensions of gender inequality.

The tendency to prioritise economic arguments while taking note of equity considerations indicates that institutions may be attempting to find a balance between these two perspectives. For instance, while making largely economic arguments, the *2021 ASEAN Gender Outlook* also noted equity dimensions: '…as new technologies rapidly expand across the region, many young women and mothers may find opportunities to join the labour market through the digital economy or to balance childcare responsibilities with paid work through remote arrangements' (Duerto-Valero et al., 2021: 25). It also stated, 'Promoting women's involvement in the information and communications fields … could also… promote the development of innovation and infrastructure that better fits women's needs' (Duerto-Valero et al., 2021: 26).

Box 1: Startup Pinay and Investing in Women – Interplay between Economic and Social Equity Objectives

In 2019, QBO Innovation Hub established Startup Pinay to promote a favourable economic landscape for female-led technology startups in the Philippines. Its mission is to provide female-led tech startups with the exposure, networks, and capacity building that they need to thrive in the global digital economy. The programme's activities include bootcamps, workshops, and mentorships to cultivate fledgling female entrepreneurs by validating their business ideas and training them on effective business development. Startup Pinay has collaborated with She Loves Tech, a global competition in which emerging female entrepreneurs pitch their ventures on a global stage. It also produces resources such

as startup ecosystem mapping reports, documenting major industry players, as well as the availability of resources, such as co-working spaces, that support women founders in different regions of the country.

While Startup Pinay's activities focus on economic empowerment, the stated underlying objective is to use the programme to help shift gender norms, especially on the role of women in the workplace. This gender norms agenda seems in part related to QBO's partnering with Investing in Women in 2021 to support the *Influencing Gender Norms Strategy*. Investing in Women is an initiative of the Government of Australia that aims to foster inclusive economic growth through workplace gender equality, impact investments for women entrepreneurs, and influencing gender norms. It views gender norms, amongst other things, as critical obstacles to women's economic empowerment. As such, its *Influencing Gender Norms Strategy* targets four perceptions about gender roles: (i) that women's primary role is caring for children and family members; (ii) that men's role is as primary income earner and provider for the family; (iii) that certain job types are specific to women and others to men; and (iv) that men are better in leadership roles, and women are better in supportive roles.

As with most such programmes, the economic or business case is at the forefront of its mission, with the implied expectation that the success of the economic perspective will ultimately demonstrate the value of the social equity dimension. Thus, the strategy anticipates that by supporting women entrepreneurs and highlighting their successes, programmes like Startup Pinay will 'create the perception that anyone – whether woman or man – can be a successful startup founder'. Due to Startup Pinay's infancy, it remains to be seen what its impact on the Filipino tech ecosystem will be and whether that impact will extend to transforming the broader environment of gender norms.

Sources: QBO. https://www.qbo.com.ph/; QBO. Startup Pinay, https://www.qbo.com.ph/startup-pinay; *BusinessWorld* (2020); Investing in Women (2020a and 2020b).

3.2. Causes of Women's Unequal Status in Digital Leadership

Across the most relevant articles, perceived causes of gender inequality in digital leadership fall into four categories: people, structures and systems, policy, and the pandemic.

3.2.1. People

Impediments to women in digital leadership are often presented as caused by people. People-related causes characterise gender inequality in digital leadership as stemming from a lack of human capital or the behaviour, beliefs, and attitudes of people at individual or demographic levels. At the individual level, they tend to take the form of deficit narratives, especially regarding women. Deficit narratives typically characterise historically marginalised or oppressed demographics as the cause of their own problems (Davis and Museus, 2019a, 2019b). Specifically, people-related causes often suggest that there are gender disparities in education, industry, policymaking, and other leadership roles, because women lack the desire, motivation, or skills to fill them.

When the problem is presented as a demographic or social issue, articles suggest that the individual choices of women (or others) result in fewer women in STEM industries; in aggregate, these choices discourage other women from pursuing careers in STEM (i.e. lack of female role models is a cause of low female interest in STEM occupations). To address gender inequality in the digital economy, then, commentators imply that trends within the entire demographic group need to change.

Discussion of the deficits of other types of individuals and groups (e.g. men or design teams) are less evident. This is likely to lead to lopsided solutions targeted at changing the behaviour of individual women or women as a social group. For instance, the passage below may give the impression that women's lack of confidence is the reason why there are few women in AI jobs:

> In her keynote, Kay Firth-Butterfield, head of AI and machine learning and member of the executive committee of the World Economic Forum, addressed the need for diverse teams creating AI products. Today, women comprise half the global population, but less than a quarter of the individuals creating algorithms [...] She underlined the need to promote female role models and offer

mentoring to women and girls, so they can build the confidence to enter the world of technology and AI (UNESCO, 2021).

3.2.2. Structures and Systems

Another category of perceived causes is structures and systems, including the structures of social, economic, and political institutions. This category attributes women's digital inequality to how organisations, markets, or entire economies and systems of governance operate, or how social institutions (e.g. the family) are organised. They note that inequalities are built into the design of historical or contemporary social, economic, and political infrastructure, such as judicial and legal systems, economic and geographic segregation of demographic groups, and social norms. These structures determine how resources and responsibilities are allocated and accessed and are seen as complicit in limiting women's access to pathways (e.g. education, training, management opportunities, and business capital) that lead to meaningful participation in the digital economy.

Conversely, structures and systems are also presented as not adequately addressing gender gaps in education, skills training and retraining programs, recruiting, and employment. Common structural causes cited include the fact women are more likely to live in poverty, tend to work in the informal economy, are denied employment advancement opportunities, and encounter legal barriers to resources such as property and business capital. For example,

> in the private sector, [women] are less present in company leadership and technical roles in tech industries. The lack of equal opportunities in the workplace is driving women out of research professions, the UN officials said, urging that the principle of equality be put into action so that science works for women, because it works against them all too often (UN, 2022).

At the socio-cultural level, some articles suggest that gendered practices such as women's greater domestic and caretaking responsibilities, as well as cultural bias and prejudices, contribute to women's inequality in digital leadership. For example, although not specifically focussed on the digital economy, the *Antara News* (2021) stated, 'APEC members are making noteworthy strides toward advancing women's participation in the regional economy, but … sociocultural gender biases hinder further progress, according to the updated APEC Women and the Economy Dashboard 2021'.

This category of causes is arguably more expansive than the people category, as it implies that to make progress on gender digital equality, the aggregate attitudes and behaviours of others – in addition to those of women – need to change. Across the board, the underlying source of structure and system causes are not fully explained or explored.

3.2.3. Policy

Policy-related causes characterise challenges to women's equality in digital leadership as stemming from policies that disadvantage women or from the absence or ineffective implementation or management of existing policies designed to achieve gender equality. Mostly, such policy references are not specifically related to the digital economy. Policies that disadvantage women can include rules that do not allow women to work in the same industries as men, as noted in some media stories (e.g. *Antara News,* 2021) or that make it difficult for women to own property or to have a bank account (e.g. Bacasmas, Carlos, Katigbak, 2022). Examples of references to the absence or poor implementation of facilitating policy include the observation by one article that 'only 10 APEC economies in 2020 have a mandate for equal pay for work of equal value' (*Antara News,* 2021). In addition to socio-cultural biases, the same article also cites 'inadequate policies' as a hindrance to women's participation in the Asia-Pacific Economic Cooperation (APEC) economy.

Despite some allusions to inadequate policies, there are very few papers, reports, or media stories that comment on or aim to evaluate the performance of specific policies, strategies, or initiatives. An example that comes closest to doing this is UNESCAP (2021) that assessed the implementation of sustainable trade facilitation measures in the region. The measures include three strategies to facilitate women in trade (including digital trade), concluding that

> despite gender equality being mainstreamed in many policy initiatives, specific gender concerns for female traders remain limited and do not extend to trade facilitation. … more than 50% of the countries have implemented trade facilitation measures to benefit women involved in trade, although essentially on a pilot or partial basis" (UNESCAP, 2021: 28).

Another example is a study of women-owned micro and SMEs in Manila, which found that there is limited awareness of national and regional policies relevant to

women-owned micro and SMEs. Similarly, IFC (2019: 59) reported that although Cambodia has policies in place to support women entrepreneurs, there is a need for 'effective coordination and complementarity across various government agencies'.

3.2.4. COVID-19 Pandemic

Unsurprisingly, pandemic-related narratives have pervaded discussions of women's digital inequality since 2020. In the context of the COVID-19 pandemic and the resulting mobility and caregiving crisis, digital access and entrepreneurship are perceived as the panacea to gender inequality. Some view the pandemic as exacerbating the inequality of women in the digital economy, whilst others view it as having opened up e-commerce opportunities for women.

Box 2: COVID-19 Pandemic Accelerates the Digital Turn for Women Entrepreneurs in Cambodia

When the COVID-19 pandemic shutdowns began in 2020, Cambodia was still a largely cash- and paper-based economy. A rapid transition was therefore needed to adapt to the use of digital systems. Women entrepreneurs unable to navigate digital and e-commerce spaces were at risk of being left behind. Recognising this, SHE Investments, a business incubator targeting women-run small and medium-sized enterprises, quickly turned its attention to equipping women entrepreneurs with the skills to adapt their operations to a digital environment. In partnership with Youth Business International and with funding from Google.org, SHE Investments offered training on basic and intermediate skills such as how to take good photographs for websites or use a digital wallet. The effort was very successful, not only in terms of exceeding its trainee target numbers, but also in terms of its post-training impact – most of the roughly 100 participants were able to withstand the economic shock of the shutdowns and ultimately created or restored about 600 jobs.

The training is now being scaled up in partnership with the Ministry of Women's Affairs for further delivery. The programme was not without its challenges, however. For example, training processes were time-consuming, as a significant level of one-on-one mentoring was required to build participants' self-confidence in addition to digital competencies. SHE Investments looks forward to

seeding a new vision of what it means to participate in the digital economy, by promoting ordinary women and their businesses as role models of digital leadership.

Source: C. Boyd, executive director, SHE Investments.

3.3. Solutions to Women's Unequal Status

Proposed solutions range from individual to industry, policy, and social measures. However, they are often not clearly linked to the perceived causes, and specific accountable stakeholders are not identified. Considering the multifaceted nature of gender inequality in digital leadership, it is not surprising to find a plethora of recommendations, some generic and others specific (Table 2). As noted by Fifer et al. (2019: 7):

> what's needed to create gender inclusion varies tremendously across the region. [The region] is home to some of the world's most gender-equal societies … but also some that are below the global average… Given this disparity, gender inclusion initiatives across the region tackle a vast number of issues, from leadership progression, parity, traditional cultural norms for the role of women and girls in society, and access to education to more symbolic issues such as workplace dress codes. And every country in the region has a different approach to ensure that women both enter and stay in the workforce.

Table 2: Proposed Solutions in Research Literature

Government-oriented
• Address gender digital inequality in national policy (Curtis et al., 2022)
• Develop regulatory interventions with a gender lens (APEC, 2022; Elhan-Kayalar, Sawada, van der Muelen Rodgers, 2021)
• Increase awareness on gender mainstreaming (ASEAN, 2021; UNESCAP, 2021)
• Promote innovation policies (UNESCAP, 2018)
• Develop policies to promote women-led micro and SMEs (Bacasmas, Carlos, Katigbak, 2022)

- Improve communication on existing programs to support women entrepreneurs (Bacasmas, Carlos, Katigbak, 2022; IFC, 2019)
- Improve policy implementation (Krentz et al., 2020; OECD, 2018)
- Develop policies on telework and online labour (Bacasmas, Carlos, Katigbak, 2022)
- Ensure gender inclusivity in public programmes (Anukoonwattaka et al., 2021)
- Remove regulatory barriers to women owning property (Bacasmas, Carlos, Katigbak, 2022; White, 2021)
- Facilitate access to fintech services and platforms (IFC, 2019)
- Incentivise/enable use of digital technologies by women entrepreneurs (Tanti et al., 2021; UNESCAP, 2018)
- Regulate web-based digital labour (Elhan-Kayalar, Sawada, van der Muelen Rodgers, 2021; Trajano, 2021)
- Address automation risk to women's jobs (Karr, Lokshin, Loh, 2020)
- Expand social safety nets (Elhan-Kayalar, Sawada, van der Muelen Rodgers, 2021; Karr, Lokshin, Loh, 2020)
- Address data security (Elhan-Kayalar, Sawada, van der Muelen Rodgers, 2021)
- Institute measures to provide parental leave, child care facilities and other support services for women (Karr, Lokshin, Loh, 020)
- Establish programs to build ICT capabilities (APEC, 2022; Raimi, Mirela, Hysa, 2021)
- Promote ICT curriculum in schools (UNESCAP, 2018)
- Invest in gender-based research and gender-disaggregated data on micro and SMEs and jobs at risk of automation (Bacasmas, Carlos, Katigbak, 2022; Karr, Lokshin, Loh, 2020)

Industry/Organisation-oriented

- Establish diversity programmes and policies (Fifer et al., 2019; Rastogi et al., 2020)
- Establish recruitment programmes for women/gender-neutral hiring policies (Anukoonwattaka et al., 2021; Rastogi et al., 2020)

- Establish retention programmes for women (Rastogi et al., 2020)
- Institute gender equality measures (Trajano, 2021)
- Establish pay transparency policies, and address gender pay gaps (Anukoonwattaka et al., 2021; Trajano, 2021)
- Address workplace harassment (Bacasmas, Carlos, Katigbak, 2022; Trajano, 2021)
- Reduce transaction costs for banking services (Sioson and Kim, 2019)
- Offer flexible work arrangements (Anukoonwattaka et al., 2021)
- Provide digital skills training for women-owned micro and SMEs (Marsan and Ruddy, 2020)
- Provide capacity building programs on ICT, e-commerce, and financial literacy (Raimi et al., 2021)
- Encourage women to adopt fintech services (Imam et al., 2022)

ICT = information and communication technology, SMEs = small and medium-sized enterprises.
Source: Authors.

Notwithstanding this necessary multiplicity, sometimes the proposed solutions do not clearly align with the implied or explicitly defined problem. Solutions are often proposed without clearly demonstrating the link amongst the problem, cause, and solution. It is not always clear that the issue that the solution addresses is the actual problem. Two examples of problems that are relatively aligned with causes and proposed solutions are summarised in Table 3, with the first example being more well-constructed than the second.

Table 3: Sample Problem Definitions

Problem	Cause	Proposed Solution	Stakeholders
Reconstructed from Rastogi et al. (2020)			
Unbalanced and inequitable technology workforce	Women's perceptions and preferences Limited career and advancement opportunities	Targeted approaches that focus on the three critical junctures in a career that can have a disproportionate impact in shaping choices	Companies Governments and schools Women

Problem	Cause	Proposed Solution	Stakeholders
Women leave technology careers at critical junctures.	Family roles	about a future in technology	
Reconstructed from Bacasmas, Carlos, Katigbak (2022)			
Women-led micro and SMEs are unable to capitalise on the gains of e-commerce.	Lack of access to information on international trade and programmes Poor digital connectivity and know-how Gender-based harassment and violence Lack of training Lack of financing Lack of local and global business networks	Raise the level of awareness amongst women-owned micro and SMEs on the RCEP and relevant government programmes Accelerate efforts to address the key gender challenges Multi-level and gender-inclusive e-commerce governance framework Gender mainstreaming efforts anchored in international organisations Incorporate gender-inclusive language into e-commerce provisions Establish an enabling environment for e-commerce and secure access to finance Plan for the long-term improvement of information technology skills	Policymakers

Problem	Cause	Proposed Solution	Stakeholders
		Design labour market policies around teleworking and flexible hours of online work Research and disaggregated data on women-owned micro and SMEs	

RCEP = Regional Comprehensive Economic Partnership, SMEs = small and medium-sized enterprises.
Source: Authors.

Solutions tend to implicate government or organisational policy, but specific stakeholders are usually not identified. As such, the locus of accountability for implementation is not obvious. It is also notable that very few recommendations target the socio-cultural layer. Several articles also include examples of promising initiatives, although these are usually snapshots and rarely indicate how the initiative performs over time. Some of them are untraceable, inactive, or their status is unclear.

Box 3: Gender-Lens Investing – A Focussed Strategy to Support Women in Digital Leadership

Access to business capital is one of the primary barriers to women taking leadership roles in digital entrepreneurship. Women-led businesses receive only about 9% of private equity and venture capital funding in South and East Asia. Public and private sector investors can contribute to addressing this challenge through gender-lens investing (GLI). GLI is the practice of investing with gender as a determining factor for the investment decision. At the core of GLI is the understanding that women are not able to realise their full potential because of unconscious biases in the corporate world, and that such biases and disparities must be deliberately and aggressively addressed.

GLI tends to target three types of businesses: (i) female-owned businesses, (ii) businesses that demonstrate a high level of commitment to gender equity or that

have gender-diverse leadership, or (iii) businesses whose products and services primarily seek to improve the lives of women and girls. GLI may also entail an investment company changing its own internal processes, teams, and structures to become more gender cognisant. During its earlier years in Asia, GLI appears to have primarily targeted the third type of business – according to the Gender Impact Investing Network, between 2007 and 2017, almost 90% of GLI capital in South-East Asia went to microfinance institutions, as these institutions generally focus on women's financial inclusion. Recent studies indicate that the primary understanding of GLI in the region today is investing in women-led businesses, possibly because this approach is easier to define, implement, and measure. GLI in South-East Asia between 2017 and 2019 covered a wide range of economic sectors, with health care and education receiving the most interest, and microfinance featuring much less significantly.

GLI is relatively new in South-East Asia, and local investors often do not self-identify as gender lens investors, even if they are practicing GLI principles. In comparison to global trends, the amount of capital raised is low but growing, mostly led by the private sector – the total amount raised by GLI vehicles targeting the region in 2019 was $1.3 billion, an 80% increase over 2018. The COVID-19 pandemic also appears to have stimulated interest in GLI, as it uncovered both the potential of e-commerce for women entrepreneurs and the failings of non-diverse business models. Indonesia has the largest number of GLI investments in the region, and together with the Philippines and Viet Nam, accounted for 80% of GLI deals in the region between 2017 and 2019.

While globally there is conviction that GLI can yield returns comparable to other types of investing, in South-East Asia, some fund managers have expressed disappointment at the lower-than-expected returns from their GLI portfolios. Other challenges include preconceived or inaccurate notions such as the view that investing in women requires deprioritising financial returns; difficulty in identifying female-owned or -focussed businesses; scarcity of data on gender metrics to guide investment decisions; concerns about 'pink washing' businesses; and perceptions that GLI frameworks are too burdensome. Despite these challenges, there is optimism about the business case for GLI in South-East Asia.

Although there are multiple approaches to GLI, it represents a relatively clearcut strategy to address a very specific problem. Promoting GLI within the ASEAN digital economy could be a focussed strategy to address the challenges that women face in acquiring business capital for ventures in the digital economy. In the longer term, it could also motivate businesses to pursue more gender-diverse business models.

Sources: Moonshot Brokers (2021), IFC (2021), Gender Impact Investing Network (2018), Investing in Women (2021), Lucas and Thomson (2021), Morgan Stanley (2016), Sasakawa Peace Foundation (2020), Velezmoro (2021).

3.4. Resources

Both data and non-data resources address gender inequality in digital leadership in some respects. Policies and strategies to address women's unequal status in digital leadership require a variety of resources for effective implementation. These could be human, spatial, material, system, or policy needs, some of which may be readily available, whilst others may need to be deliberately acquired or allocated. Typically, policy implementation strategies outline where the required resources – especially material resources – will come from. To a large extent, this determines the feasibility of proposed solutions. Rhetoric on gender digital equality communicates the resources that commentators draw on themselves to make their arguments, those that they perceive to be actively addressing the problem (i.e. functioning resources), and those that they perceive to be lacking (i.e. non-functioning resources).

Two main categories of resources are represented, data and non-data. Based on the research and media reports, both types of resources are somewhat functioning and non-functioning.

3.4.1. Data Resources

Data as resources are leveraged to contextualise issues in the data economy and can provide evidence to propel policy action by helping demonstrate the nature, magnitude, or impact of a problem. On one hand, stakeholders may cite data or research findings to illustrate problems and challenges surrounding women's leadership in the digital economy. On the other, they may refer to data (e.g. gender-

disaggregated data) as resources that are missing and therefore inhibiting the ability to address gender inequalities.

Data can be used to celebrate success and/or to draw attention to a problem. Such celebratory data sharing can motivate national governments to engage with issues publicly in the news. Several such instances are observed in media reports wherein stakeholders highlight when their economy or government is identified as either improving the country's stance in international rankings or performing better than others in advancing gender equality. For example:

> The Philippines is still the top-ranked country in Asia and, at number 16, the only Asian country in the top 20 nations. The country dropped eight notches from its 2019 ranking. As gathered by the Philippine Commission for Women (PCW), the Philippines has closed 78% of its overall gender gap, garnering a score of 0.781 (*Manila Bulletin,* 2021).

Rastogi et al. (2020) drew extensively on data to illustrate both the ongoing challenges as well as countries with high performances:

> The challenge is particularly acute for the technology industry, where women's participation in school and the workforce is systematically lower than in other industries. Of technology majors in Southeast Asia, for example, 39% are women (compared with 56% for all other fields of study). And in the workforce, women account for 32% of the region's technology sector, compared with 38% of the total workforce. … Singapore and Vietnam have the lowest share of women with technology majors in the region yet both have higher shares of women working in technology, with Singapore amongst the highest of the six countries we studied, at 41%.

Data resources are often used to communicate needs, whether for policy, people, materials, space, or systems. For example, World Economic Forum data are used to emphasise the problem of gender inequality as one of people and human capital:

> Women's voices are not feeding into the blueprint for our future. According to World Economic Forum data, only 22% of AI professionals globally are women. Companies hiring experts for AI and data science jobs estimate fewer than 1% of the applications they receive come from women. Women and girls are 4 times less likely to know how to programme computers (UNESCO, 2021).

Finally, several articles note the lack of adequate data to measure and to understand gender dynamics in the digital economy. This data need is often expressed as a recommendation, without necessarily having defined lack of data as a problem, such as ‘improve gender disaggregated data to provide a basis for fact-based policymaking’ (Marsan and Ruddy, 2020).

3.4.2. Other Resources

Apart from data, other necessary resources cover the spectrum of people, policy, materials, space, and systems. They include computers or devices, software, information systems, money or funding, infrastructure, technology or trade policy, and organisational or industry policy. Notably, they are rarely associated with the needs of a particular policy but rather in reference to whatever aspect of the general problem of gender digital inequality is being covered (e.g. international trade, e-commerce, or fintech). They primarily propose what types of tools, practices, or interventions are needed if gender digital inequality is to be addressed. As with data, these other resources appear to be both functioning and non-functioning. While mentioned as positive indicators in certain respects, it is also noted that further inputs and implementation are needed to advance strategies towards gender equality in the digital economy.

References to a need for more female entrepreneurial role models, or more women with data science or AI training, for example, can be categorised as highlighting a non-functioning resource (e.g. female role models). Conversely, articles also frequently cite examples of successful females in the digital economy, effectively utilising them as role models. In this sense, stakeholders present people as functioning or non-functioning resources and provide case examples where notable changes in human resources occurred that they believe helped address the gender challenges existing in the digital economy. For example, the following illustrates a training programme as a functioning resource:

> In Indonesia, the Girls Innovation Camps programme fostered partnerships with [information technology] companies to better match workforce supply and demand as well as expose students to the latest technology, real work

environments, and personal skills required by the 21st century world of work (Sims and Thuo, 2020: 4).

Similarly, comments about lack of policy (e.g. on equal pay) or disadvantageous policy (e.g. gender-based restrictions on property ownership) signal a view of policy as a non-functioning resource that can be brought into service of gender digital equality, like this suggestion on facilitating digital leadership: 'Economies recommended three main suggestions [such as] the need for policy initiatives and mechanisms to incorporate the specific needs of women in digital literacy." (APEC, 2022: 3)

4. Conclusions and Recommendations

Clarity of problem definition. Overall, there is no doubt that media, research, and policy rhetoric recognise women's inequality as a serious problem in the ASEAN digital economy. However, the nature of the problem itself (i.e. its dimensions, causes, and solutions) – especially in terms of digital leadership – is rarely clearly defined. This lack of clarity is also associated with a tendency to propose solutions in equally vague or generic terms, or as a laundry list of desirable actions. Admittedly, gender-based inequalities in the digital economy are multifaceted and require multifaceted and expansive solutions. While it is important to appreciate and to address the problem holistically, once the problem has been comprehensively mapped out, solutions should be focussed and targeted. A good example is the report by Rastogi et al. (2020) in which the authors outlined a set of factors that affect women's decisions to study, pursue a career, and remain in a technology profession; and propose a range of actions to target each decision stage.

Recommendation 1. Policymakers (e.g. in gender, science and technology, labour, and education ministries) should communicate more well-constructed definitions of women's inequality in digital leadership. Likewise, in their coverage of this topic, media organisations and researchers should attempt to articulate the problems more clearly. This involves breaking down the issue into subsets of issues – encompassing problems, their perceived or actual causes, potential solutions, and necessary resources. Notably, this process can enable determination of whether the problem is one that requires a policy-, implementation-, or management-oriented

response. Logical and evidence-based connections should be established amongst identified problem subsets, causes, and solutions, guided, for example, by this adaptation of five policy issue criteria from Howland, Becker, and Prelli (2006):

(i) Is the problem accurately defined?

(ii) Is the proposed action (i.e. policy, implementation, or management) an appropriate solution?

(iii) Does the proposed solution have the necessary support?

(iv) Is the proposed solution feasible?

(v) Who is accountable for implementation of the solution?

Balancing economic narratives with social justice and equity narratives. The dominance of economic narratives to support the need for more women in digital leadership demonstrates a higher interest in women as an engine of economic growth than in equal representation. While economic arguments appear to be more persuasive in current times, social justice and equity arguments suggest solutions that although challenging to achieve, more directly target the fundamental socio-economic and political structures that sustain women's unequal status in multiple facets of life. However, promoting women's digital leadership as a matter of principal cannot really be forced; doing so risks 'pink washing' (i.e. making a superficial expression of support for women's empowerment without real commitment or action) or backlash in the long term. The reality is that the economic narrative is more likely to gain the attention of (largely male) industry and policy leaders, and, as such, will continue to be the primary narrative. Ultimately, the key to successfully addressing women's inequality in digital leadership may lie in how effectively stakeholders are able to navigate the tension between these two narratives.

Recommendation 2. Policymakers, media, and researchers in the ASEAN region should continue leveraging the economic argument for women's participation in the digital economy. In parallel, however, they should explore and develop strategies to advance social justice and equity as foundational goals for sustaining women's equal participation in digital leadership.

Range and depth of analysis in media and research coverage. Women's status in digital leadership receives patchy coverage in the media and insufficient

examination in academic and policy research. Much of the discourse focusses on issues of digital access and skills; when digital leadership is tackled, it is at a relatively superficial level or lacks the depth of analysis needed to fully understand the issues as they pertain to the ASEAN region. Because media coverage tends to coincide with events such as International Women's Day or International Day of Women and Girls in Science, news stories often consist of reproductions of statements made by officials or other stakeholders during activities held to mark those observances. No instances were found of deeper reporting, either examining policy initiatives or reflecting on the scale of the problem in ASEAN Member States. Considering the important role that both the media and researchers play in communicating social issues, examining and reflecting public opinion, and providing the knowledge base for policy formulation, it is essential that they deepen their treatment of the topic of women in digital leadership with a clear focus on the ASEAN region to ensure context-relevant policy responses.

Box 4: From Research to Industry and Policy Impact – The Role of the Media and Researchers

Previously presumed to be neutral and free from human error, facial recognition technology is now widely understood to be embedded with a variety of biases, including an inability to correctly identify the features of certain people. The uncovering of this weakness is largely credited to research by a Massachusetts Institute of Technology scholar whose experiment showed gender and racial bias in the artificial intelligence (AI) systems sold by several tech giants. Overall, the systems were better at identifying male faces; they had error rates of 1% or less for lighter-skinned men but up to 35% error rates for darker-skinned women. This, according to the research, can be attributed to the fact that the datasets used to train facial recognition systems contained mostly male and light-skinned faces.

Apart from publishing a journal article, the researcher also shared her findings with tech companies, testified before the United States House Committee on Oversight and Reform, and engaged extensively with domestic and global media, including writing several opinion pieces. The research was covered in depth in outlets such as *Time*, *The Telegraph*, The New York *Times*, *The Atlantic*, BBC, PBS, Bloomberg, and NBC News. The researcher's goal was to use public pressure and

market competition to motivate companies to fix biases in software. The media strategy appears to have been successful, as companies like IBM and Microsoft subsequently made improvements to their facial recognition technology, and policy agencies also started examining the issue. Problems still remain with facial recognition technology, but the collaboration of research and media played a critical role in bringing visibility to the issue.

Sources: Buolamwini (2019), Barbican Centre (2019), Government of the United States, House Committee on Oversight and Reform (2019), Singer (2019).

Recommendation 3. Researchers and media institutions in ASEAN Member States should give more attention to researching and reporting on women's status in digital leadership within the region. An essential aspect of this is to independently assess the implementation and management stages of existing policies and strategies and to communicate publicly on their effectiveness. This will, of course, depend on policymakers' willingness to share relevant information. Actions can include:

(i) Media institutions broadening their windows for reporting on gender digital equality beyond commemoration events. Adopting a more evaluative approach to covering the topic will also support monitoring of policy successes and shortcomings, flag opportunities for stakeholders to influence policy direction, and keep policymakers alert to the public interest in this issue.

(ii) Researchers enhancing efforts to connect with policymakers and the media to share research and data on women and digital leadership within the ASEAN economy. They can also conduct studies to understand the impact of media coverage (or lack thereof) on public opinion and policy responses to the issue.

Data, monitoring, and evaluation. The relatively heavy dependence on global, European, or North American data to characterise women's inequality in digital leadership highlights the need to improve the collection of gender-disaggregated data within the ASEAN economy. There is a critical lack of even baseline data on the degree and nature of women's participation in the digital economy (i.e. most of the economic gender data appears to focus on women in the textiles, clothing, and

footwear industry). Without routine data collection and monitoring systems, it will be impossible to systematically assess whether policies and strategies are working.

Recommendation 4. Policymakers should actively mainstream monitoring and evaluation of policies meant to improve the status of women in digital leadership, including leveraging independent research and media coverage to enhance public understanding of the issues on an ongoing basis. Systematically collected longitudinal data are essential to effectively track and to manage both expected and unexpected results of policy initiatives. This will also facilitate understanding of the extent to which gender equality in digital leadership in ASEAN is a policy, implementation, or management problem and guide appropriate allocation of resources to address it.

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