

# Women and work pressures in the industry 4.0

**Tran Thi Thanh Binh**

*Hung Yen University of Technology and Education*

---

## **Abstract**

*In the Industry 4.0 era, characterized by technological explosion and rapid changes in the workplace environment, women face numerous new challenges. This paper investigates the pressures women endure at work, from balancing work-life issues and gender disparities in the workplace to demands for new skills and technologies. To address these challenges, the paper proposes solutions such as flexible work policies, family care support, skills training, gender bias elimination, psychological support, promotion of pay equity, and career advancement opportunities. Using practical examples from Vietnam, the paper underscores the importance of collaborative efforts among businesses, government, and society in creating conditions for sustainable female development in careers and positive contributions to socio-economic development in the Industry 4.0 era.*

**Keywords:** women, work, Industry 4.0.

---

Date of Submission: 01-07-2024

Date of acceptance: 11-07-2024

---

## **I. Introduction**

The Industry 4.0 era presents numerous opportunities but also poses significant challenges to the workforce, particularly for women. The integration of digital technology, Internet of Things (IoT), artificial intelligence (AI), and big data has transformed how we work and interact. However, not everyone finds it easy to adapt to these changes, and women often face more pressures than men.

Industry 4.0, also known as the Fourth Industrial Revolution, marks a profound change in how we work, live, and interact. Its hallmark is the convergence of digital, biological, and physical technologies, leading to breakthroughs in areas such as artificial intelligence (AI), Internet of Things (IoT), big data, robotics, and 3D printing. This development not only creates new opportunities but also presents significant challenges, especially for the female workforce.

Women, who have traditionally faced numerous challenges in traditional work environments, now confront new pressures from the rapid transformation of Industry 4.0. While new technologies may bring plentiful job opportunities and avenues for advancement, without adequate preparation and support, women risk falling behind and struggling to adapt.

For instance, a study by the International Labour Organization (ILO) reveals that high-tech sectors such as IT, engineering, and computer science often exhibit lower female representation compared to males. This implies fewer opportunities for women to access high-paying jobs with strong growth potential in the Industry 4.0 era. Moreover, a significant digital skills gap poses another major barrier. According to a report by the World Economic Forum, women are often less trained and exposed to new technological skills, widening the skills gap between genders.

One of the most significant pressures on women in the Industry 4.0 era is balancing work and family life. With technological advancements, the boundary between work and personal life has become increasingly blurred. Remote work, emails, and online communication applications enable employees to work anytime, anywhere, but they also create pressures to work beyond office hours and reduce time for family.

For example, a survey by McKinsey & Company during the COVID-19 pandemic highlighted increased pressures on women in managing childcare and household responsibilities compared to men. Working from home often means women simultaneously juggle multiple responsibilities, from professional duties to family caregiving, leading to stress and burnout.

Despite advances in promoting gender equality, women still contend with disparities in wages and opportunities for advancement. In many fields, particularly those related to technology and engineering, women are often undervalued in terms of capability and potential for development. This not only impacts income but also affects women's morale and work motivation.

For instance, according to a Harvard Business Review study, although women constitute a significant portion of the global workforce, they have fewer opportunities to ascend to senior management positions. The study also indicates that women often need to demonstrate their capabilities more than men to be recognized and promoted in their careers.

The Industry 4.0 era demands continuous updating and enhancement of skills, particularly those related to technology. However, women often face more difficulties in accessing and learning these new skills. Reasons include lack of confidence, time constraints due to family responsibilities, and inadequate tailored training programs.

For example, an OECD report shows that women are less likely to participate in technology and digital training courses compared to men. This leads to challenges in keeping pace with rapid changes in the labor market and increases the risk of missing out on good job opportunities.

In conclusion, the Industry 4.0 era brings both opportunities and challenges for women in the workplace. To help women overcome these pressures and achieve sustainable career development, concerted efforts from government, businesses, and communities are essential. Only with supportive policies and appropriate training programs can women fully leverage the opportunities presented by the Industry 4.0 era.

## **II. Balancing work and life pressures**

In the Industry 4.0 era, continuous connectivity and the ability to work remotely have blurred the boundaries between work and personal life. This particularly affects women, who often juggle multiple roles simultaneously. Balancing work and family life has become a significant challenge, demanding greater efforts from women to maintain harmony between personal responsibilities and professional duties.

Technology brings convenience but also introduces substantial pressures. Mobile devices and online work applications allow employees to work anytime, anywhere. Consequently, women face pressures to work beyond regular hours, even when at home. For instance, research from the Harvard Business Review indicates that women often feel compelled to check work emails in the evenings or weekends, leading to stress and reducing time for family.

Women frequently take on family caregiving and household management roles. This dual burden places additional strain, requiring them to exert more effort to fulfill both work and family responsibilities. A Pew Research Center survey reveals that women spend more time than men on childcare and household chores. When confronted with work pressures, they often experience greater fatigue and exhaustion.

Remote work, a prevalent trend in the Industry 4.0 era, offers flexibility but also introduces new pressures. Women, especially those with young children, confront the challenge of managing both work and family within the same space. A report from McKinsey & Company highlights that during the COVID-19 pandemic, women faced greater pressures in childcare and household management while working remotely compared to men.

Women often sacrifice personal time to meet work and family obligations. This not only affects mental well-being but also impacts work performance. Research from the American Psychological Association indicates that women frequently experience higher levels of stress and anxiety than men due to insufficient rest and leisure time.

Balancing work and life pressures poses a significant challenge for women in the Industry 4.0 era. Continuous connectivity and the ability to work remotely exacerbate these pressures, necessitating women to exert greater efforts to maintain harmony between personal and professional responsibilities. To alleviate these pressures, support from both businesses and society is crucial through flexible work policies, family care assistance, and psychological counseling programs. Only then can women achieve balance and sustainable development in their careers.

## **III. Gender disparities in the workplace**

Gender disparities in the workplace remain a pressing issue despite ongoing efforts to promote gender equality. Women often confront both visible and invisible barriers, ranging from wage gaps to limited opportunities for career advancement, as well as gender biases. These disparities not only affect women's income and career development opportunities but also have negative impacts on their morale and work motivation.

One of the most evident manifestations of gender disparity is the wage gap. According to the World Economic Forum (WEF), globally, women on average earn about 77% of what men earn in the same position and industry. This means women have to work an additional 44 days per year to earn the equivalent amount as men.

For instance, in the information technology (IT) sector, a pivotal field in the Industry 4.0 era, gender wage disparities persist. A study by Stack Overflow revealed that female programmers often earn less than their male counterparts, despite having comparable qualifications and experience.

Women also frequently encounter challenges in advancing to managerial and leadership positions. McKinsey & Company's research indicates that women occupy only about 21% of senior executive positions in large companies. Gender biases and societal cultural factors often hinder women from being promoted and advancing in their careers compared to men.

A notable example is in the financial sector, where women often face barriers to ascending to leadership roles. Despite possessing sufficient skills and experience, gender biases and professional networks tend to favor men.

Gender biases are a primary factor contributing to gender disparities in the workplace. Women are often perceived as having lower capabilities and less potential for development compared to men. A study by the Harvard Business Review shows that women frequently need to prove their competence more than men to gain recognition and career advancement opportunities.

For example, in meetings and work discussions, women's opinions are often overlooked or given less weight than those of their male counterparts. This not only diminishes women's confidence but also affects their ability to contribute and develop in their roles.

These disparities and biases not only impact women's income and career development opportunities but also negatively affect their morale and work motivation. Women often feel pressured and stressed at work, leading to exhaustion and decreased work performance.

Addressing gender disparities in the workplace is crucial for ensuring fairness and sustainable development. Achieving this requires collective efforts from businesses, governments, and society to promote equal pay, create opportunities for advancement, eliminate gender biases, and provide psychological support for women. Only then can women fully leverage their potential and contribute effectively to societal development in the Industry 4.0 era.

#### **IV. Demands for new skills and technologies**

The era of Industry 4.0 brings about significant transformations in the labor market, characterized by the emergence of numerous new technologies and rapid digital advancements. This necessitates continuous updates and enhancements in workforce skills, particularly those related to information technology, artificial intelligence, big data, and automation systems. Despite achieving substantial progress in education and training, women still face numerous challenges in meeting these new requirements.

One of the major challenges for women is the ability to access and update new technological skills. Due to their multiple familial and societal responsibilities, women often lack the time and resources to participate in advanced training courses. Consequently, they lag behind men in grasping and applying new technologies.

For instance, an OECD study reveals that women participate less in digital skills training courses compared to men. This disparity is particularly pronounced in high-tech fields, where technological skills and knowledge are pivotal to career success.

Digital literacy is one of the most critical requirements in the Industry 4.0 era. This encompasses not only basic computer and software proficiency but also knowledge in programming, data analysis, and information technology management. Women, especially those not working directly in the technology sector, often struggle to grasp and develop these skills.

For example, within the financial sector, the rise of fintech has created a significant demand for digital skills. However, women in this industry often lack the necessary skills to work with emerging technologies such as blockchain, artificial intelligence, and data analytics, limiting their career development and advancement opportunities.

The rapid pace of technological change demands high adaptability. Women, especially those who have been long-time workers in specific industries, often face difficulties in transitioning and adapting to new technologies. This challenge stems not only from skill gaps but also psychological factors such as self-doubt and concerns about learning and adaptation capabilities.

A notable example is in the healthcare sector, where new technologies like surgical robots, artificial intelligence in diagnosis and treatment require healthcare professionals to continuously update their knowledge and skills. Women, who constitute the majority of the healthcare workforce, often face significant pressure to learn and effectively utilize these technologies.

Offering free or low-cost training courses on new technological skills, especially tailored for women, is essential. These courses should be designed flexibly, allowing women to learn at their own pace. Businesses should invest in internal training programs, encouraging and supporting female employees to participate in technology-related courses and workshops. Governments and social organizations should establish programs that incentivize and support women in education and skill development, including scholarships, grants, and other forms of financial assistance. Building a supportive work environment where women feel encouraged and respected in their learning and skill development processes is crucial. This includes eliminating gender biases and promoting equal access to training opportunities.

The demands for new skills and technologies in the Industry 4.0 era present numerous challenges for women, from accessing and updating skills to adapting to new technologies. Overcoming these challenges requires support from businesses, governments, and society through training programs, policies that encourage learning,

and creating supportive work environments. Only then can women seize the opportunities presented by the Industry 4.0 era and achieve sustainable career development.

## **V. Proposed solutions**

### ***Solution 1: Flexible working policies***

One of the most effective solutions to alleviate the work-life balance pressures on women is the implementation of flexible working policies. Flexible work arrangements include telecommuting, flexible working hours, and part-time work options. These policies empower women to manage their work schedules and leisure time more effectively, facilitating an easier balance between work and family responsibilities.

For example, leading technology companies like Google and Microsoft have implemented flexible working policies that allow employees to work remotely and choose suitable working hours. This not only enhances work-life balance but also boosts employee productivity and satisfaction. In Vietnam, although remote work and flexible working hours have begun to be adopted by some enterprises, they are not yet widely prevalent. Many traditional businesses still maintain fixed working hours from 8 AM to 5 PM, posing challenges for women in balancing work and family life.

### ***Solution 2: Family care support***

Businesses should provide family care support services to alleviate the burden on women. These services may include on-site childcare facilities, financial support for childcare expenses, and parental leave programs. Such supports enable women to have more time and resources to focus on work without worrying excessively about family responsibilities.

For instance, in developed countries like Sweden and Denmark, governments and businesses have implemented on-site childcare support programs at workplaces, allowing women to work with peace of mind and advance their careers. Some multinational corporations operating in Vietnam, such as VinGroup and TH Group, have begun to offer on-site childcare services or financial support for childcare. This initiative not only helps women feel secure at work but also fosters their career development.

### ***Solution 3: Training and skill development***

To help women grasp and apply new technologies, appropriate training and skill development programs are essential. Courses on digital skills, programming, data analysis, and information technology management should be widely accessible and designed with flexible timings and locations, enabling women to participate without compromising their family and current work responsibilities.

A prominent example includes free or low-cost digital skills training programs offered by Google and Coursera, benefiting women globally by providing opportunities to learn and enhance technological skills. Organizations like SheCodes Vietnam and online courses by FUNiX have also provided specialized technology training programs for women. These courses empower women to improve skills and confidently engage in high-tech industries.

### ***Solution 4: Gender bias eradication***

Creating an equitable and supportive work environment requires educational programs and heightened awareness of gender equality within businesses and society. These programs may involve seminars, courses, and communication campaigns aimed at changing perceptions and attitudes towards women in the workplace.

For example, major companies like IBM and Deloitte have implemented diversity and inclusion programs that enhance employee awareness of gender equality values and encourage active participation of women in the workforce. Initiatives such as the "HeforShe" campaign initiated by the United Nations in Vietnam have spurred activities to promote gender equality and eliminate biases. Companies like Unilever and Nestlé have also launched internal programs to raise awareness of gender equality values in the workplace.

### ***Solution 5: Psychological support***

Work and family life pressures can adversely affect women's mental health. Therefore, businesses should provide psychological counseling services and emotional support for female employees. These programs help women reduce stress, improve mental health, and enhance work motivation.

For instance, companies like SAP and Johnson & Johnson have implemented psychological support programs for employees, including individual counseling sessions, support groups, and physical activities to reduce stress. Multinational companies operating in Vietnam, such as HSBC and Intel, have also started providing psychological counseling services for employees. These programs help employees, especially women, alleviate stress and maintain good mental health.

### **Solution 6: Promoting pay equity**

To ensure income fairness, businesses need to implement fair pay policies to ensure women are paid commensurate with their skills and contributions. Regular salary checks and adjustments help identify and rectify gender wage gaps.

For example, Salesforce, a leading technology company, conducted salary checks and adjustments to ensure no gender wage gap among its employees. Some Vietnamese companies like Vinamilk and Viettel have implemented salary check and adjustment policies to ensure income fairness between male and female employees.

### **Solution 7: Creating advancement opportunities**

Businesses should develop leadership training and skill development programs for women while creating opportunities for them to participate in and advance into managerial positions. This enables women to have career development opportunities and contribute to business growth.

For example, many multinational companies like Unilever and PepsiCo have implemented leadership development programs specifically for women, equipping them with the necessary skills and experiences to advance to senior management positions. Programs such as PwC Vietnam's "Women in Leadership" and Deloitte Vietnam's "Leadership Development Program" provide training courses and mentoring for women, helping them acquire essential skills and experiences for advancement into senior management roles.

## **VI. Conclusion**

Women are facing numerous challenges in both work and life in the Industry 4.0 era, ranging from the pressure of balancing work and family responsibilities, gender disparities in the workplace environment, to demands for new skills and technologies. To alleviate these pressures and create conditions for sustainable career development for women, comprehensive and effective solutions are necessary. Flexible working policies, family care support, skills training, gender bias eradication, psychological support, promoting pay equity, and creating advancement opportunities all play crucial roles. The collective efforts of businesses, governments, and society will empower women to seize opportunities and positively contribute to socio-economic development in the Industry 4.0 era.

## **References**

- [1]. Darma, G. S., & Krismajayanti, N. P. A. (2020). Challenges and strategies to encourage women to be entrepreneurs in the industrial revolution era. *Review of management, accounting, and business studies*, 1(1), 9-16.
- [2]. Cetinkaya, A. S. (2021). The impact of industry 4.0 strategy on the work-life balance of employees. *University of South Florida (USF) M3 Publishing*, 5(2021), 64.
- [3]. Behic, S. W., Pasman, H. J., Khan, F. I., Shell, K., Alarfaj, A., El-Kady, A. H., & Hernandez, M. (2023). Leadership 4.0: The changing landscape of industry management in the smart digital era. *Process safety and environmental protection*, 172, 317-328.
- [4]. Cuninkova, L., Kubisova, E., Cambal, M., & Chlpekova, A. (2021, November). Impact of Industry 4.0 on the job positions during COVID-19 pandemic in Slovakia from HR perspective. In *2021 19th International Conference on Emerging eLearning Technologies and Applications (ICETA)* (pp. 97-102). IEEE.
- [5]. Demirbağ, K. Ş., & Yıldırım, N. (2023). The Elephant in the Room: New Skills and Work Dimensions of Turkish White Goods Industry Engineers in Industry 4.0 Era. *IEEE Transactions on Engineering Management*.
- [6]. Bai, C., Dallasega, P., Orzes, G., & Sarkis, J. (2020). Industry 4.0 technologies assessment: A sustainability perspective. *International journal of production economics*, 229, 107776.
- [7]. Rani, T. J., & Priya, V. K. Exploring the Concept of Managing Women Employees' Work-Life Balance in Information Technology Company. In *Designing Workforce Management Systems for Industry 4.0* (pp. 265-284). CRC Press.
- [8]. Irina, N. (2021). Industry 4.0 Supporting Sustainable Development. *Industry, Innovation and Infrastructure*, 588-600.
- [9]. Serrano, D. R., Fraguas-Sánchez, A. I., González-Burgos, E., Martín, P., Llorente, C., & Lalatsa, A. (2023). Women as Industry 4.0 entrepreneurs: unlocking the potential of entrepreneurship in Higher Education in STEM-related fields. *Journal of Innovation and Entrepreneurship*, 12(1), 78.
- [10]. Li, L. (2020). Education supply chain in the era of Industry 4.0. *Systems Research and Behavioral Science*, 37(4), 579-592.
- [11]. Campanile, G. (2019). Artificial intelligence and emotional intelligence, the contribution of women 4.0: training course of empowerment for women in Industry 4.0. *Form@ re-Open Journal per la formazione in rete*, 19(1), 412-420.
- [12]. Jatningsih, O., & Sari, M. M. K. (2020, March). "Gender and Education": Preparing Teacher Candidates of Civics to Build Egalitarian Society in Industry 4.0 Era. In *2nd Annual Civic Education Conference (ACEC 2019)* (pp. 227-232). Atlantis Press.
- [13]. Kumar, R., Sindhvani, R., Tewary, T., & Davim, J. P. (Eds.). (2022). *Principles of Entrepreneurship in the Industry 4.0 Era*. CRC Press.