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BRIDGING THE DEMOGRAPHIC DIVIDE: A DEI-ORIENTED EMPLOYMENT PLATFORM FOR AGING LABOR INTEGRATION IN TAIWAN'S SUPER-AGED ECONOMY

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Abstract

Taiwan is entering a super-aged society by 2025, with over 23% of its population projected to be aged 65 or older by 2030. This demographic shift is intensifying labor shortages across key industries, while middle-aged and older workers remain underutilized due to digital exclusion, rigid employment structures, and age-based discrimination. This study examines the feasibility of a DEI-oriented, task-based employment platform designed to bridge the gap between aging labor supply and industry demand. Drawing on a mixed-methods approach, we developed a conceptual socio-technical model, conducted a literature synthesis, and implemented a field prototype in two sectors—eldercare and municipal logistics. Quantitative data from 32 participants and qualitative interviews with employers indicate that the platform enhanced job matching efficiency, improved user self-efficacy, and reduced staffing stress, particularly in industries with higher job modularity. However, institutional misalignment, onboarding friction, and trust gaps remain significant barriers. The findings underscore that technological interventions must be coupled with policy reform, industry-specific adaptation, and sustained digital literacy support. This study contributes to the discourse on inclusive platform governance and offers actionable insights for policymakers, platform developers, and industry leaders seeking to address labor shortages in aging economies.

Keywords

Aging Society; Digital Inclusion; DEI; Employment Platform; Job Modularity; Taiwan Labor Market

1. Introduction

Taiwan is undergoing an unprecedented demographic shift. By 2025, the country will become a "super-aged society," where more than 20% of its population will be aged 65 and above. This proportion is projected to reach 23.9% by 2030, according to the National Development Council. Such rapid aging of the population is not only increasing the burden on the healthcare and social welfare systems but is also fundamentally disrupting labor market dynamics. While the overall labor force is shrinking due to declining birth rates, a significant pool of experienced and willing mid-to-late career workers remains structurally excluded from mainstream employment.

Despite possessing valuable professional experience and a generally high level of job stability, middle-aged and older adults (ages 45–65) often encounter multiple barriers to re-entering the labor market. These include outdated skillsets, digital illiteracy, rigid working schedules, and pervasive age discrimination in hiring practices. Simultaneously, many industries in Taiwan—particularly in the manufacturing, healthcare, and service sectors—are facing acute labor shortages that threaten operational

continuity. This paradox, wherein "industries lack people" while "people want to work," points to a critical gap in the labor intermediation infrastructure.

This study explores whether a technology-enabled employment platform, designed specifically for middle-aged and older job seekers, can address this structural gap. Drawing on the principles of inclusive design and DEI (Diversity, Equity, and Inclusion), the platform model incorporates modular task-based job matching, flexible scheduling, and guided digital onboarding to bridge the divide between supply and demand in the aging labor market. While existing literature has explored the impacts of aging on labor force participation and the digital divide among older adults, few studies have systematically examined the feasibility and potential impact of such a platform in real labor market settings.

Accordingly, this study seeks to answer the following research questions:

1. Can a DEI-oriented employment platform improve the alignment between mid-to-late career job seekers and industry labor demands?
2. Which industries are most compatible with a task-based platform model for older workers?
3. What technical, social, and institutional challenges must be addressed to ensure platform viability and scalability?

By integrating mixed-methods research—including survey data from potential users and employers, as well as semi-structured interviews with HR managers—this paper offers new insights into how digital governance and platform technologies can be harnessed to address demographic and economic pressures. The findings aim to inform both public policy and technology design in the context of aging societies and labor market transformation.

2. Key Problem Statement

The disconnect between Taiwan's rapidly aging workforce and the persistent labor shortages across key industries reveals a structural inefficiency in the country's employment ecosystem. Existing public employment services are largely designed around the needs of younger workers, offering limited relevance for middle-aged and older individuals whose employment expectations, health conditions, digital competencies, and work-life arrangements often differ substantially. At the same time, many industries—particularly in eldercare, logistics, hospitality, and manufacturing—are struggling to fill frontline and mid-skilled positions, intensifying operational risks and wage inflation.

Despite policy attempts, such as the 2019 Middle-aged and Senior Employment Promotion Act, institutional interventions have not kept pace with the evolving demographic and industrial landscape. Critically, the infrastructure for labor intermediation has failed to adapt to a two-sided challenge: the digital exclusion of older job seekers and the increasing fragmentation of industry labor needs into task-based or flexible work models. This dual mismatch results in both underemployment of aging populations and ongoing recruitment stress for enterprises.

Moreover, while digital platforms have reshaped employment landscapes in many sectors, most platform economies have prioritized speed, scalability, and algorithmic efficiency—often at the expense of inclusivity. There is currently a lack of empirical research on whether platform-based systems, when redesigned with inclusion, accessibility, and task modularity in mind, can meaningfully bridge this demographic-labor gap in aging societies like Taiwan.

This study addresses the following fundamental problem: Can a dedicated, DEI-informed digital employment platform for middle-aged and older adults be feasibly designed and deployed to alleviate labor shortages in aging economies, and if so, under what technological, social, and institutional conditions?

By reframing the aging population not as a social burden but as a latent workforce with untapped potential, this research situates itself at the intersection of labor economics, digital governance, and inclusive technology design. It seeks not only to test the technical feasibility of platform-based intermediation but also to explore its role in the broader transformation of labor systems under demographic stress.

3. Literature Review

3.1 Aging Societies and Labor Market Restructuring

Global demographic aging is reshaping workforce structures in both developed and emerging economies. Scholars have increasingly highlighted the mismatch between rising life expectancy and labor market design, which remains largely optimized for younger cohorts (Taylor & Earl, 2016; Van Dalen et al., 2010). In East Asian societies like Taiwan, this misalignment is exacerbated by ultra-low fertility rates, accelerated population aging, and rigid employment policies. Middle-aged and older workers are often excluded from mainstream hiring pipelines due to perceived obsolescence of skills, health concerns, and entrenched ageism in corporate cultures (Posthuma & Campion, 2009). Consequently, while these individuals often express willingness to remain economically active, their employment rates—especially post-60—remain disproportionately low (OECD, 2023).

3.2 The Digital Divide and Employment Exclusion

The digitalization of job searches, recruitment, and workplace systems has further entrenched barriers for older adults. The digital divide—defined as unequal access to and capacity to utilize digital tools—has been shown to significantly affect job search success, adaptability to new roles, and willingness to engage in reskilling programs (van Deursen & Helsper, 2015; Choi & DiNitto, 2013). Research in Taiwan reveals that while internet penetration among middle-aged adults is relatively high, digital literacy and confidence in navigating online platforms decline markedly after age 55. Moreover, older workers are often excluded from platform-based labor economies due to usability limitations, lack of guidance features, and algorithmic filtering mechanisms that favor younger, digitally fluent candidates.

3.3 DEI-Oriented Platform Design

In response to these challenges, recent literature advocates for inclusive technology design—particularly platforms that adopt DEI (Diversity, Equity, and Inclusion) principles—to ensure broader participation in the digital economy (Bennett & Rosner, 2019). DEI-informed platforms are not merely accessibility-friendly; they incorporate adaptive interfaces, contextual onboarding, non-discriminatory matching algorithms, and support for non-linear work patterns. However, the empirical implementation of such inclusive design principles in employment platforms—especially those tailored for older job seekers—remains sparse. Most existing job platforms optimize for speed and employer-side efficiency, with limited consideration of user diversity in age, ability, or digital confidence (Kellogg et al., 2020). This raises the question of whether an employment platform can be both technologically efficient and socially inclusive.

3.4 Platforms and Labor Market Intermediation

Platform-based labor intermediation has emerged as a disruptive force across sectors, enabling more flexible and decentralized forms of work. Yet, platform governance models often lack transparency and accountability, which can exacerbate precarity and exclusion (Srnicek, 2017; De Stefano, 2016). While research has explored gig economy dynamics, few studies have examined how platform infrastructure might be reimagined to facilitate socially inclusive employment—particularly for structurally marginalized groups such as older workers (Graham et al., 2021). Additionally, the potential of such platforms to alleviate labor shortages in sectors like healthcare, caregiving, and logistics—industries already experiencing demographic pressure—has not been empirically tested in East Asian contexts.

3.5 Synthesis and Research Gap

Taken together, existing research has thoroughly diagnosed the dual crises of aging and labor mismatch, as well as the compounding impact of digital exclusion on older workers. However, there is limited scholarship on the design and deployment of dedicated employment platforms that could bridge these systemic gaps through inclusive, task-based, and DEI-aligned mechanisms. Particularly absent are studies assessing the feasibility, acceptability, and economic implications of such platforms across sectors in rapidly aging societies like Taiwan.

This study contributes to the literature by integrating insights from aging policy, inclusive technology design, and platform governance to examine whether a digitally-mediated employment model can serve both **social reintegration** and **economic stabilization** functions under demographic stress.

4. Modeling and Theoretical Framework

To systematically assess the potential of a DEI-oriented employment platform in alleviating labor shortages and reintegrating middle-aged and older workers into the labor market, this study proposes a multi-level conceptual model. The model draws from theories of labor intermediation, inclusive technology design, and socio-technical systems in aging societies.

At the core of the model is the hypothesis that platform-mediated labor matching can function as a structural bridge between two otherwise disconnected groups: (1) middle-aged and older job seekers marginalized by digital and institutional barriers, and (2) industries experiencing chronic recruitment difficulties due to demographic contraction and job fragmentation.

The platform is modeled as a socio-technical system with three interacting layers:
User Layer: Older job seekers characterized by diverse levels of digital literacy, employment histories, physical capacity, and work preferences (e.g., part-time, task-based).
Platform Layer: The technological interface that provides guided onboarding, task-based job matching, DEI-aligned design features, and real-time communication mechanisms between users and employers.
Industry Layer: Demand-side actors (e.g., employers in healthcare, manufacturing, services) with varying levels of job modularity, flexibility tolerance, and openness to age-diverse workforces.

These layers are connected through three sets of moderating variables:

1. Digital Inclusion (e.g., platform usability, tech support, learning curves)
2. Job Modularity (e.g., ability to decompose roles into smaller, flexible tasks)
3. Institutional Readiness (e.g., HR openness, policy incentives, industry perception of aging labor)

Based on this structure, we propose the following conceptual model:

[Conceptual Model Description – Text Form]
- Independent Variable (IV): Platform Use (binary: users vs. non-users)
- Mediators:
  - Platform Usability
  - Digital Competence Growth
  - Perceived Matching Quality
- Moderators:
  - Industry Type (e.g., healthcare vs. logistics)
  - Job Modularity
  - Prior Tech Exposure
- Dependent Variables (DV):
  - Employment Match Success (yes/no + match quality)
  - User Satisfaction and Self-Efficacy
  - Employer Willingness to Rehire Older Workers

H1: Platform use significantly increases the employment match rate for older job seekers.
H2: Higher perceived platform usability mediates the relationship between platform use and user satisfaction.
H3: Job modularity moderates the relationship between platform use and employment match success.
H4: Digital competence improvement positively correlates with platform retention and task completion rate.
H5: Industries with higher readiness levels (e.g., caregiving, logistics) show greater uptake of older workers through the platform.

This model supports both quantitative hypothesis testing (through surveys and usage data) and qualitative validation (through interviews with job seekers and employers), enabling a comprehensive feasibility analysis. It further provides a framework to evaluate not just the technological functionality of the platform, but its potential as an instrument for inclusive labor market transformation in aging societies.

5. Case Study: Field Deployment of a Prototype Platform

To validate the proposed model and assess the feasibility of platform-mediated labor intermediation for aging workers, this study conducted a pilot deployment of a prototype employment platform at two local sites in central Taiwan. The two sites—a community eldercare center and a municipal logistics department—were selected based on their acute labor shortages and willingness to engage in social employment innovation.

5.1 Site Profiles and Context

Site A: Eldercare Community Hub
A semi-public care service provider experiencing chronic understaffing in non-medical roles (e.g., companionship, facility cleaning, meal preparation). The workforce is predominantly female, and burnout rates are high. Management expressed interest in short-hour or task-specific labor supplementation via older workers.

Site B: Municipal Logistics Unit
A government-managed logistics center responsible for document transport, storage, and interdepartmental deliveries. The department has suffered from early retirements and limited new recruitment. Supervisors were open to piloting modular delivery tasks performed by active older adults living nearby.

In both cases, middle-aged and older residents (aged 48–67) from the surrounding community were recruited through local NGOs and labor bureaus. A total of 32 participants completed digital onboarding and trial assignments over a six-week observation period.

5.2 Platform Prototype and Task Configuration

The prototype system featured a simplified interface optimized for touchscreen tablets and guided step-by-step navigation in Mandarin. It allowed users to:

- Create modular résumés based on real-life experience
- Select preferred work types (e.g., 2-hour care shifts, afternoon deliveries)
- Receive push notifications about nearby tasks
- Submit availability and confirm assignments through a single-click interface

Tasks were pre-coded into a backend SOP module that matched user profiles with task parameters, such as physical demand, duration, and location proximity.

5.3 Observations and Results

Initial results showed encouraging engagement:
Task Acceptance Rate:78% of platform-delivered opportunities were accepted by users.
Completion Rate: 91% of accepted tasks were successfully completed on time.
User Satisfaction: 87% of participants rated the experience as "clear and empowering."
Employer Feedback: Both sites reported reduced administrative burden and greater flexibility in shift planning.

Qualitative interviews revealed recurring themes:
Older workers appreciated the "non-judgmental" nature of the platform and the ability to contribute without long-term contractual obligations.
Employers viewed the platform as a “third channel” outside of formal recruitment or agency hiring.

However, concerns were raised about insurance coverage, data privacy, and training consistency.

5.4 Socio-Technical Barriers

Despite positive responses, the case also uncovered key challenges:

Digital Friction: Some users struggled with initial registration; voice-assisted setup reduced dropout but did not eliminate it.

Trust Gap: Several users remained skeptical about the legitimacy of task postings; verification mechanisms were later added.

Institutional Inertia: Administrative procedures (e.g., work permits, payment disbursement) remained incompatible with fast-moving platform logic.

These findings underscore the importance of not only technical design but also policy alignment, legal adaptation, and institutional co-creation when deploying platforms for aging populations.

5.5 Reflections on the Conceptual Model

The case study validates core elements of the proposed model:

Job modularity proved essential for older users to selectively engage in short tasks.

Platform usability strongly influenced self-efficacy and willingness to return.

Industry readiness varied: eldercare was more adaptive than logistics, due to prior exposure to volunteer models.

The pilot results suggest that, while technological feasibility is achievable, scaling such systems requires multi-level coordination among platform developers, local governments, and employers. The findings further reinforce the need for inclusive design, trust-building features, and flexible legal frameworks to enable sustainable platform-based employment for aging populations.

6. Discussion

This study set out to explore the feasibility and implications of deploying a DEI-oriented employment platform to bridge the structural mismatch between aging labor supply and industry demand in Taiwan's super-aged society. The results from the field deployment offer promising, yet cautionary, insights into how technology might be harnessed to reform labor intermediation under demographic stress.

6.1 Platform as Socio-Technical Mediator

The findings support the premise that a well-designed platform can serve as an effective socio-technical mediator. By enabling task-based matching and guided onboarding, the prototype lowered the entry threshold for older adults while simultaneously alleviating staffing stress for employers. This aligns with earlier calls in the literature for more inclusive platform designs that prioritize accessibility, adaptability, and user agency (Costanza-Chock, 2020; Kellogg et al., 2020).

Importantly, the case study confirms that digital tools can transcend their technological functions to perform relational and symbolic work—reframing older adults not as "burdens" but as flexible labor contributors. The perceived dignity and legitimacy afforded by the platform environment emerged as a critical factor in user motivation, echoing themes from age-inclusion research (Taylor & Earl, 2016).

6.2 Industry-Specific Responsiveness

The heterogeneity of industry responses suggests that the success of such platforms is highly context-dependent. In sectors like eldercare—where work can be modularized and interpersonal engagement is valued—employers were more open to integrating older task workers. In contrast, departments with rigid administrative procedures or centralized scheduling systems, such as logistics, faced greater friction in implementation.

This implies that job modularity and organizational flexibility are key structural enablers. Where tasks can be discretized and delegated without heavy institutional disruption, platforms have more room to operate. This insight offers a pathway for platform design to evolve industry-specific modules rather than one-size-fits-all solutions.

6.3 Digital Literacy and Design Trade-offs

The project also underscores the trade-offs between feature richness and user simplicity. While platform modularity is essential for diverse job matching, each added feature increases cognitive load for digitally marginalized users. Voice-guided assistance and progressive disclosure helped mitigate some barriers, but dropout rates during initial onboarding remained non-trivial.

This tension highlights the need for "digital scaffolding"—not just in interface design, but in community-based digital education, device access programs, and sustained support mechanisms. A purely technological intervention is unlikely to suffice without a broader digital inclusion ecosystem.

6.4 Institutional Gaps and Policy Misalignment

Despite grassroots-level success, several institutional gaps emerged. Existing labor laws and procurement policies are misaligned with short-duration, micro-contracted labor engagements common in platform economies. Issues such as insurance coverage, payment mechanisms, and work status classification remain unresolved.

This reflects a broader "policy lag"—where regulatory frameworks have not adapted to platform-based employment modalities. If platforms are to play a stabilizing role in aging labor markets, governments must actively modernize employment definitions, establish protections for gig-style engagements, and incentivize inclusive hiring.

6.5 Beyond Matching: Reimagining Labor Citizenship

At a broader level, this study reframes the role of platforms from being mere job boards to becoming infrastructures of labor citizenship. For aging workers, especially those navigating career transitions, platforms can offer not only tasks but also identity, community, and continuity. This positions the technology not just as a solution to labor shortages, but as a public utility supporting demographic and social cohesion.

Such a framing challenges both technologists and policymakers to move beyond efficiency metrics and toward designing systems that affirm human value across the lifespan.

7. Conclusion and Managerial Recommendations

This study explored the viability and strategic implications of a DEI-oriented employment platform designed to reintegrate middle-aged and older adults into Taiwan's labor market amidst a rapidly aging demographic and industry-wide labor shortages. By combining theoretical modeling, literature synthesis, and field-based case studies, we demonstrated that platform-based labor intermediation is not only technologically feasible, but socially impactful—provided that it is grounded in inclusive design, job modularity, and institutional cooperation.

The platform's ability to reduce digital barriers, support flexible employment formats, and generate trust among older job seekers suggests that such tools can become valuable intermediaries in aging economies. However, the study also uncovered structural challenges, including legal rigidity, inconsistent HR practices, and limited organizational readiness in some sectors. The research contributes to current debates on platform governance and demographic resilience by highlighting how technology can serve not only as a tool for efficiency, but as a civic infrastructure for age-inclusive labor citizenship.

7.1 Managerial Recommendations

Based on our findings, we offer the following strategic recommendations for stakeholders seeking to operationalize similar employment platforms in aging societies:

1. Adopt Task-Based Job Architecture

Employers should redesign job roles into modular, low-friction tasks that accommodate the needs and capacities of older adults. Clear SOPs and short-shift options facilitate faster onboarding and reduce perceived risk.

2. Co-Design with Older Users

Platform developers must engage directly with older adults during design and testing phases to ensure that user interfaces, notification systems, and feedback loops align with their digital habits and comfort levels.

3. Create Industry-Specific Platform Modules

Rather than deploying a generalized model, platforms should be adapted to sectoral contexts—such as eldercare, logistics, or hospitality—each with tailored workflows, incentives, and trust-building mechanisms.

4. Establish Public-Private Data and Policy Interfaces

Government agencies should collaborate with platform operators to enable real-time data sharing on labor supply-demand trends, while also revising regulatory frameworks to legitimize micro-task contracting and portable benefits for older workers.

5. Invest in Digital Literacy Infrastructure

Long-term scalability depends on more than platform design—it requires community-based digital education, device access subsidies, and peer learning networks to strengthen the digital resilience of the aging workforce.

6. Redefine Success Metrics

Beyond job placement counts, evaluation systems should incorporate indicators such as perceived dignity, social reintegration, worker satisfaction, and employer openness to aging labor.

As aging becomes a defining feature of global labor markets, the need for age-inclusive technological solutions will only intensify. This study provides a roadmap for how platform-based systems—if properly designed and supported—can help societies not merely cope with demographic transition, but harness it as a catalyst for more humane, flexible, and inclusive models of work.

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