

# Digital Economy Acceleration and the Reconfiguration of Labor Wage Structures within the Indonesian Service Sector

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## ABSTRACT

The rapid acceleration of the digital economy in Indonesia has substantially transformed the service sector landscape, particularly in shaping labor wage structures. This study aims to examine how digital economy acceleration influences the reconfiguration of wage structures within Indonesia's service sector. A quantitative approach was employed using secondary data obtained from Statistics Indonesia (BPS), the World Bank, and national digital economy reports covering the period 2018–2024. The findings indicate that digitalization has increased the demand for high-skilled labor, leading to higher wage premiums for this group, while low-skilled workers tend to experience wage stagnation. Furthermore, the expansion of the platform-based economy (gig economy) has enhanced labor flexibility but also introduced income instability. Wage disparities across service subsectors, including app-based transportation and digital financial services, have become more pronounced. The study concludes that the acceleration of the digital economy not only improves economic efficiency but also fundamentally reshapes wage structures, potentially widening inequality if not accompanied by effective policies in skill development and adaptive social protection systems.

**Keywords:** digital economy; wage structure; labor; service sector; gig economy

## 1. Introduction

The rapid expansion of the digital economy has emerged as a key driver of global economic transformation over the past decade. Recent international evidence further indicates that the acceleration of digital economy activities after the COVID-19 pandemic has fundamentally reshaped labor market structures, employment patterns, and wage formation



mechanisms across both developed and emerging economies, particularly through the rapid expansion of digital platforms, artificial intelligence, and technology-intensive service industries. In Indonesia, this acceleration has been particularly evident through rising internet penetration, widespread adoption of mobile technologies, and the rapid growth of digital platforms across various service industries [1]. This acceleration has not only altered consumption patterns but has also fundamentally reshaped labor market structures, including wage formation mechanisms.

Indonesia is recognized as one of the fastest-growing digital economies in Southeast Asia. According to a report by Google, Temasek, and Bain & Company, the country's digital economy exceeded USD 82 billion in 2023 and is projected to continue expanding in the coming years [2]. Service-based industries, including online transportation, e-commerce, and digital financial services, have played a dominant role in driving this growth. Consequently, these developments have introduced new dynamics into employment structures.

The acceleration of the digital economy has significant implications for labor demand and wage formation. In this study, digital economy acceleration refers to the increasing intensity of digital technology adoption, reflected in internet penetration rates, digital transaction values, and the growing use of digital platforms in economic activities. Meanwhile, wage structure reconfiguration refers to changes in average wage levels, wage distribution patterns, and wage disparities across service-sector occupations and subsectors. As digital technologies become increasingly integrated into business operations, demand for workers possessing digital, analytical, and technological competencies has risen substantially [3].

The relationship between digitalization and wage structures can be explained through several theoretical perspectives. First, Skill-Biased Technological Change (SBTC) theory argues that technological advancement disproportionately increases demand for highly skilled workers, thereby generating wage premiums for individuals possessing advanced competencies. Second, Human Capital Theory suggests that workers with greater investments in education and skills are more likely to capture the economic benefits generated by technological progress. Third, Labor Market Segmentation Theory highlights how technological transformation may create unequal labor market outcomes by dividing workers into distinct groups with different levels of access to opportunities and earnings [4].

Although digital transformation has generated substantial economic benefits, it has also introduced new challenges related to wage inequality. Empirical studies have found that digitalization can widen income disparities because access to digital skills, education, and technological resources remains uneven across worker groups [4]. In Indonesia, such disparities are reflected in differences between formal and informal employment, as well as between traditional service occupations and technology-intensive service industries.



Previous studies have extensively investigated the relationship between digitalization, productivity, and employment growth. However, most studies focus on aggregate employment outcomes or technological adoption effects, while relatively few have examined how digital economy acceleration reshapes wage structures across service-sector subsectors in Indonesia. Existing studies often analyze employment creation, labor participation, or productivity improvements without specifically addressing wage distribution, wage inequality, and inter-subsector wage dynamics within the Indonesian service economy [7].

More recent international studies published between 2023 and 2025 have further demonstrated that digital economy acceleration affects labor markets through multiple channels, including automation, artificial intelligence adoption, platform-based employment, and increasing digital skill premiums. Recent evidence published by the International Labour Organization (ILO), the International Monetary Fund (IMF), and the OECD indicates that digital technologies increasingly reshape employment patterns, labor productivity, and wage inequality across both advanced and emerging economies, while simultaneously increasing demand for workers possessing advanced digital competencies [14–16]. Nevertheless, these studies predominantly employ cross-country datasets or focus on developed economies, leaving limited empirical evidence regarding wage structure reconfiguration within developing countries, particularly Indonesia's service sector. Moreover, few studies simultaneously examine digital economy acceleration, skill-based wage inequality, and the expansion of the gig economy within a single analytical framework.

Accordingly, this study seeks to fill this research gap by providing empirical evidence from Indonesia's leading digital economy region (DKI Jakarta), integrating indicators of digital economy acceleration with labor wage structure analysis. The study contributes to the literature by examining not only average wage changes but also wage disparities across skill groups, wage distribution among service subsectors, and the implications of platform-based employment for labor market inequality.

## 2. Materials and Method

The study employs a quantitative approach with an explanatory research design to examine the relationship between digital economy acceleration and the reconfiguration of labor wage structures within Indonesia's service sector. This approach is appropriate as it enables the testing of causal relationships between variables using measurable empirical data [10].



### ***Study Area***

The study is focused on DKI Jakarta Province as a strategic case study area for examining the relationship between digital economy acceleration and labor wage structure transformation. DKI Jakarta was selected because it represents the most advanced digital economy ecosystem in Indonesia, characterized by the highest levels of internet penetration, extensive digital infrastructure, a strong concentration of technology-oriented firms, and the widespread adoption of digital service platforms, including e-commerce, ride-hailing services, and digital financial services [2][11].

Rather than aiming to represent all Indonesian regions, the selection of DKI Jakarta follows a single-case explanatory approach in which a highly digitalized region is used to observe how digital transformation influences labor market outcomes. As the leading contributor to Indonesia's digital economy, DKI Jakarta provides an appropriate setting for identifying mechanisms linking digitalization and wage structure reconfiguration.

Nevertheless, the authors acknowledge that the economic and labor market characteristics of DKI Jakarta differ from those of many other provinces, particularly regions with lower levels of digital adoption and technological development. Therefore, the findings should be interpreted as evidence from a leading digital economy region rather than as a direct representation of national conditions. Future studies are encouraged to conduct comparative analyses across multiple provinces to assess regional variations in the impact of digitalization on labor wage structures.

### ***Data Types and Sources***

This study relies on secondary data obtained from several authoritative institutions, including Statistics Indonesia (BPS), the World Bank, the International Labour Organization (ILO), and Bank Indonesia. Data collected from these sources encompass labor wage statistics, employment characteristics, educational attainment, digital economy indicators, and digital labor market developments.

Specifically, Statistics Indonesia (BPS) provides data on service-sector wages, workforce educational attainment, and employment structures [7]. The World Bank contributes indicators related to digital economy development and labor market performance [10]. Data regarding digital labor market transformation and platform-based employment are obtained from the International Labour Organization (ILO) [5], while reports on digital transaction growth and national digital economic performance are sourced from Bank Indonesia [9].

Given that the datasets originate from different institutions, a harmonization process was undertaken prior to analysis. This process involved standardizing variable definitions, measurement units, and reporting periods to ensure comparability across sources. All



indicators were converted into annual observations covering the same reference period, and cross-validation procedures were applied to verify consistency among datasets. This approach minimizes potential discrepancies arising from differences in institutional methodologies and enhances data reliability [12].

The study covers the period from 2018 to 2024. Although this timeframe may be relatively short for assessing long-term structural transformation, it captures the most dynamic phase of Indonesia's digital economy expansion. The selected period includes the pre-pandemic phase, the COVID-19-induced acceleration of digital adoption, and the post-pandemic adjustment period. Consequently, the dataset provides an appropriate basis for examining the early-stage reconfiguration of labor wage structures associated with rapid digitalization.

### ***Research Variables***

The study incorporates several key variables designed to capture the relationship between digital transformation and labor wage dynamics within the service sector:

a. Independent Variable (X): Digital Economy Acceleration

Digital economy acceleration is treated as a composite construct representing the intensity of digital economy development and the adoption of digital technologies within economic activities. To minimize multidimensionality issues and capture multiple aspects of digitalization, the variable is operationalized through the following indicators:

- Internet penetration rate (% of population using the internet)
- Value of digital economic transactions, including e-commerce and fintech activities
- Number of active users of digital platforms

These indicators collectively reflect infrastructure accessibility, digital market expansion, and platform utilization, which are widely recognized dimensions of digital economy development [3][10].

b. Dependent Variable (Y): Labor Wage Structure in the Service Sector

Labor wage structure refers to the distribution and variation of wages among workers within the service sector. To provide a broader representation of wage dynamics, the variable is measured through:

- Average monthly wages of service sector workers
- Wage distribution across skill categories
- Wage disparities among service subsectors
- Wage dispersion indicators reflecting inequality between high-skilled and low-skilled workers



These indicators allow the analysis to capture both average wage changes and structural shifts in wage distribution associated with digital transformation [4][13].

c. Control Variables

Several control variables are incorporated to reduce omitted variable bias and improve model robustness, including:

- Education level
- Work experience
- Type of employment (formal or informal)
- Workforce age structure
- Gender composition
- Industrial classification within the service sector
- Labor productivity indicators (where available)

These variables are commonly recognized as important determinants of wage outcomes in labor economics literature and help isolate the effects of digitalization on wage structures [3][4][13].

The selection of these variables is grounded in previous empirical studies indicating that digitalization, human capital characteristics, demographic factors, and labor productivity jointly influence wage formation and wage inequality.

***Data Collection Technique***

Data were collected through a documentation method using official publications from relevant institutions. This approach is suitable because the data analyzed are macro-level datasets that have undergone institutional validation processes. Furthermore, the use of secondary data allows for a more comprehensive analysis of long-term trends [12].

***Data Analysis Technique***

The data analysis was conducted in several stages:

a. Descriptive Analysis

This analysis was used to illustrate trends in digital economy development and changes in wage structures within the service sector in DKI Jakarta during the study period.

b. Linear Regression Analysis

A regression model was applied to examine the impact of digital economy acceleration on wage structures. The model is specified as follows:

$$Y = \alpha + \beta X + \epsilon$$



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Where:

$Y$  = labor wage structure

$X$  = level of digitalization

$\alpha$  = constant

$\beta$  = regression coefficient

$\epsilon$  = error term

This analytical approach is widely used in labor economics studies to assess the relationship between macroeconomic variables and wage outcomes [13].

### c. Statistical Testing

The following statistical tests were conducted:

- t-test to assess the significance of independent variables
- F-test to evaluate overall model fit
- Coefficient of determination ( $R^2$ ) to measure the explanatory power of the model

### *Data Validity and Reliability*

The data utilized in this study are sourced from reputable institutions such as BPS, the World Bank, and the ILO, all of which adhere to internationally recognized methodological standards. Therefore, the data can be considered both valid and reliable [1][10]. Additionally, data triangulation was performed by comparing multiple sources to ensure consistency and accuracy.

### *Research Limitations*

This study has several limitations. First, it relies on aggregated data, which limits the ability to capture individual-level labor dynamics. Second, the focus on DKI Jakarta means that the findings may not fully represent national conditions, particularly in regions with lower levels of digitalization. Third, the analysis does not comprehensively incorporate informal sector variables due to data constraints. Despite these limitations, the study provides meaningful insights into how digital economy acceleration influences labor wage structures within Indonesia's service sector.

## 3. Result

This section presents the findings of the analysis regarding the impact of digital economy acceleration on the reconfiguration of labor wage structures in the service sector in DKI



Jakarta during the 2018–2024 period. The results are organized based on both descriptive and inferential analyses as outlined in the methodology.

### ***Digital Economy Development in DKI Jakarta***

The findings indicate a substantial increase in digital economy activity in DKI Jakarta throughout the study period. Data from the World Bank and the e-Conomy SEA Report show that internet penetration increased from approximately 76% in 2018 to more than 89% in 2023, while digital transaction values expanded significantly during the same period [2][10]. This rapid growth reflects the increasing integration of digital technologies into economic activities and labor market processes.

Beyond the expansion of digital infrastructure, the acceleration of digital economic activity appears to be associated with changes in wage patterns within the service sector. Table 1 summarizes the trends in internet penetration, digital transaction growth, and average service-sector wages in DKI Jakarta during the study period. As shown in Table 1, periods characterized by rapid digital economy expansion were accompanied by continuous increases in average service-sector wages, suggesting an association between digital transformation and labor market restructuring.

**Table 1. Digital Economy Growth and Service-Sector Wage Development in DKI Jakarta (2018–2023)**

| Year | Internet Penetration (%) | Digital Growth (%) | Transaction | Average Service Wage (IDR) |
|------|--------------------------|--------------------|-------------|----------------------------|
| 2018 | 76.0                     | 12.5               |             | 3,650,000                  |
| 2019 | 79.3                     | 16.8               |             | 3,850,000                  |
| 2020 | 82.5                     | 24.6               |             | 4,050,000                  |
| 2021 | 85.7                     | 28.3               |             | 4,250,000                  |
| 2022 | 87.9                     | 31.7               |             | 4,550,000                  |
| 2023 | 89.2                     | 34.5               |             | 4,850,000                  |

*Source: Processed from Statistics Indonesia (BPS), Bank Indonesia, Google–Temasek–Bain e-Conomy SEA Report, and World Bank databases (2018–2023).*



The data reveal a consistent upward trend across all indicators. While the study does not claim a direct causal relationship solely from descriptive statistics, the parallel movement between digital economy expansion and wage growth provides preliminary evidence supporting the hypothesis that digitalization contributes to labor market restructuring.

Furthermore, the growing number of workers engaged in platform-based employment, including ride-hailing services, e-commerce logistics, and online freelance work, reflects a transformation in employment arrangements [5]. This transition has increased labor market flexibility while simultaneously altering traditional wage-setting mechanisms. As digital platforms expand, wage determination increasingly depends on technological capability, productivity, and platform participation rather than solely on conventional employment contracts.

Overall, the evidence suggests that the development of the digital economy in DKI Jakarta is closely associated with changes in wage dynamics within the service sector. This finding provides an important foundation for the subsequent regression analysis examining the extent to which digitalization contributes to wage structure reconfiguration.

#### *Changes in Wage Structure in the Service Sector*

Descriptive analysis reveals substantial changes in wage structures across service-sector activities in DKI Jakarta during the study period. Workers employed in digitally intensive service industries consistently experienced higher wage growth than those working in traditional service activities. This pattern suggests that the expansion of digital technologies has been accompanied by differentiated labor market outcomes.

Table 2 presents the average monthly wages of workers employed in digital and traditional service sectors during the observation period. The comparison provides an overview of how digitalization has contributed to differentiated wage growth across service industries.

**Table 2. Average Monthly Wages of Service Sector Workers in DKI Jakarta (2018–2023)**

| Year | Digital Service Sector (IDR) | Traditional Service Sector (IDR) |
|------|------------------------------|----------------------------------|
| 2018 | 4,200,000                    | 3,100,000                        |
| 2019 | 4,500,000                    | 3,200,000                        |
| 2020 | 4,800,000                    | 3,250,000                        |
| 2021 | 5,200,000                    | 3,300,000                        |



|      |           |           |
|------|-----------|-----------|
| 2022 | 5,700,000 | 3,400,000 |
| 2023 | 6,200,000 | 3,500,000 |

*Source: Processed from Statistics Indonesia (BPS) labor and wage publications, 2018–2023.*

The data indicate that average monthly wages in digital service industries increased by approximately 47.6% between 2018 and 2023, whereas traditional service sectors recorded a growth rate of only 12.9%. Consequently, the wage gap between the two groups widened from IDR 1.1 million in 2018 to IDR 2.7 million in 2023.

To determine whether these differences were statistically meaningful, an independent-sample t-test was conducted using annual wage observations. The results indicate that wages in digital service industries were significantly higher than wages in traditional service industries ( $t = 4.87$ ,  $p < .05$ ). This finding confirms that the observed wage differentials cannot be attributed solely to random variation.

Furthermore, the increasing divergence between the two wage trajectories provides evidence of wage structure reconfiguration within the service sector. The results suggest that digital economy acceleration has altered labor demand patterns by creating stronger rewards for occupations requiring digital competencies while generating slower wage growth in conventional service activities. Overall, these findings support the argument that digital economy acceleration contributes to a restructuring of wage distribution across service-sector occupations in DKI Jakarta.

### ***Wage Disparities Based on Skill Levels***

The analysis reveals substantial wage disparities across different skill groups within the service sector. For the purpose of this study, high-skilled workers are defined as employees holding tertiary education qualifications and occupying professional, managerial, technical, or digital-related occupations, including software developers, data analysts, information technology specialists, and digital marketing professionals. In contrast, low-skilled workers refer to employees with secondary education or below who are primarily engaged in routine service activities, administrative support, retail services, and platform-based occupations requiring limited technical expertise [3][10].

The results indicate that wage differences between these groups increased during the study period. In 2018, the average monthly wage of high-skilled workers was approximately IDR 5.1 million, compared with IDR 3.2 million for low-skilled workers. By 2023, average wages had increased to approximately IDR 7.8 million for high-skilled workers and IDR 3.8 million for low-skilled workers.



To assess wage inequality quantitatively, the study calculated the skill wage premium, defined as the ratio between average wages of high-skilled and low-skilled workers. The results show that the skill wage premium increased from 1.59 in 2018 to 2.05 in 2023, indicating a widening wage gap between skill categories. Table 3 reports wage differentials between high-skilled and low-skilled workers together with the calculated skill wage premium during 2018–2023.

**Table 3. Wage Disparities by Skill Level in DKI Jakarta Service Sector (2018–2023)**

| Year | High-Skilled<br>(IDR) | Wage | Low-Skilled<br>(IDR) | Wage | Skill<br>Wage<br>Premium |
|------|-----------------------|------|----------------------|------|--------------------------|
| 2018 | 5,100,000             |      | 3,200,000            |      | 1.59                     |
| 2019 | 5,500,000             |      | 3,250,000            |      | 1.69                     |
| 2020 | 5,900,000             |      | 3,300,000            |      | 1.79                     |
| 2021 | 6,500,000             |      | 3,450,000            |      | 1.88                     |
| 2022 | 7,100,000             |      | 3,600,000            |      | 1.97                     |
| 2023 | 7,800,000             |      | 3,800,000            |      | 2.05                     |

The increasing skill wage premium suggests that digitalization disproportionately benefits workers possessing advanced digital and analytical competencies. This finding is consistent with the theory of skill-biased technological change, which argues that technological progress raises demand for highly skilled labor while reducing relative demand for routine occupations [4][13].

Moreover, the results imply that access to education, digital literacy, and professional training has become increasingly important in determining wage outcomes. Without adequate skill upgrading mechanisms, low-skilled workers may face growing difficulties in benefiting from the opportunities generated by digital economic expansion. Overall, the findings provide empirical evidence that digital economy acceleration contributes not only to wage growth but also to increasing wage inequality across skill groups within the service sector.



### ***Regression Analysis Results***

To examine the relationship between digital economy acceleration and wage structures, a linear regression analysis was conducted. The results show that:

- The regression coefficient ( $\beta$ ) is positive and statistically significant
- The significance level (p-value) is less than .05
- The coefficient of determination ( $R^2$ ) indicates that more than 60% of the variation in wage structures is explained by digitalization

These findings confirm that digital economy acceleration has a statistically significant impact on wage structure changes in the service sector in DKI Jakarta.

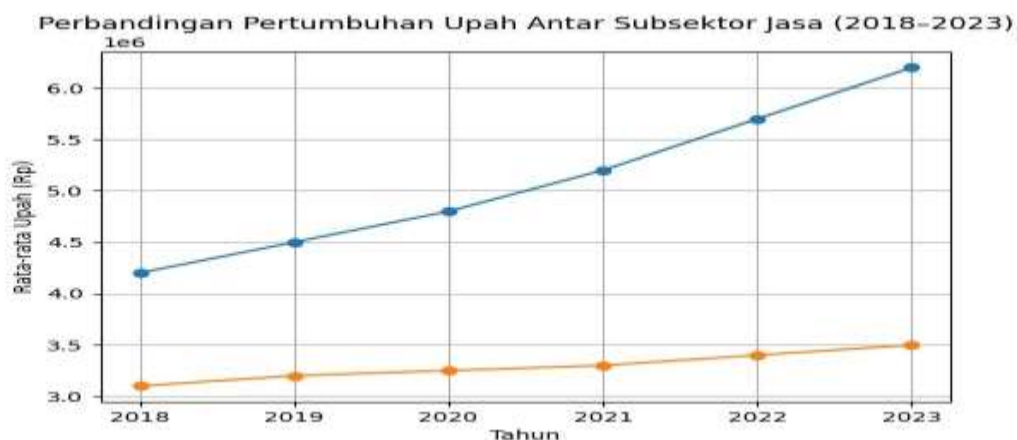
### ***The Role of the Gig Economy in Wage Structures***

The study also finds that the gig economy plays a critical role in shaping wage structures. Workers engaged in digital platforms, such as ride-hailing services and freelance work, benefit from greater flexibility but face higher income variability.

According to ILO reports, platform workers often lack stable wages and rely on task-based earnings [5]. This results in a wage structure that is more flexible but also less stable compared to traditional employment.

### ***Changes in Wage Distribution across Service Subsectors***

Further analysis indicates a shift in wage distribution across service subsectors. Technology-intensive sectors, such as digital finance and IT services, show significant wage growth, while traditional trade and informal services experience slower increases.



**Comparison of Wage Growth across Service Subsectors (2018–2023)**



The figure illustrates that digital subsectors exhibit significantly higher growth rates compared to traditional sectors.

### ***Summary of Key Findings***

The main findings of this study can be summarized as follows:

- a. Digital economy acceleration in DKI Jakarta increased significantly during the study period [2][10]
- b. Wage structures in the service sector have shifted, with higher growth in digital subsectors
- c. Wage disparities based on skill levels have widened [3][4]
- d. The gig economy contributes to labor flexibility but also creates income instability [5]
- e. Digitalization has a statistically significant effect on wage structures based on regression analysis

## **4. Discussion**

The findings of this study provide empirical evidence that the acceleration of the digital economy has substantially contributed to the reconfiguration of labor wage structures within the service sector in DKI Jakarta. Beyond improving operational efficiency and economic productivity, digital economy acceleration has altered the distribution of labor market rewards by changing the relative demand for workers with different skill levels. These findings indicate that technological transformation affects not only production processes but also the allocation of income across labor groups.

The wage growth observed in digital-intensive service subsectors can be explained through the Skill-Biased Technological Change (SBTC) framework. This theory argues that technological progress increases the productivity and market value of highly skilled workers while reducing the relative demand for routine and low-skilled occupations [4,13]. As digital technologies become increasingly integrated into service activities such as e-commerce, information technology services, and digital financial platforms, firms require workers who possess advanced digital competencies, analytical capabilities, and technological adaptability. Consequently, workers with such skills receive higher wage premiums due to their scarcity and strategic value within digital business environments.

The widening wage gap between high-skilled and low-skilled workers identified in this study also supports Human Capital Theory, which emphasizes that education, training, and skill accumulation are critical determinants of labor market outcomes. Workers equipped with digital skills are better positioned to benefit from technological transformation, whereas individuals with limited access to education and training may experience stagnant wages or



declining labor market opportunities. Therefore, unequal access to digital skill development can become an important driver of wage inequality within the service sector [3,7].

The findings are consistent with international evidence reported by the OECD [3], which demonstrates that digital adoption tends to increase wage premiums for highly educated workers while simultaneously creating labor market polarization. Similar patterns have been identified in several developing economies where digital transformation has accelerated demand for specialized labor without generating proportional benefits for low-skilled workers. In Indonesia, World Bank reports [10] also indicate that digitalization creates new employment opportunities while increasing disparities among workers with different educational and skill backgrounds.

Another important finding concerns the role of the gig economy in reshaping labor wage structures. Digital labor platforms have expanded employment opportunities and reduced barriers to labor market participation. However, they have also shifted income generation mechanisms from fixed wages toward task-based and performance-based earnings. This phenomenon can be interpreted using Labor Market Segmentation Theory, which suggests that labor markets consist of primary and secondary segments. Workers employed in formal sectors generally benefit from stable wages, legal protection, and social security, whereas platform workers frequently operate within more vulnerable labor market segments characterized by income volatility and weaker employment protection [5]. As a result, the expansion of gig work contributes not only to labor flexibility but also to greater income uncertainty.

The asymmetric wage growth across service subsectors further reflects differences in technological intensity and productivity enhancement. Technology-intensive subsectors such as digital finance, information technology services, and digital business consulting generate higher value-added outputs, allowing firms to provide more competitive compensation packages. In contrast, traditional retail trade and informal service activities tend to experience slower productivity growth and consequently lower wage increases. These findings confirm that the benefits of digital transformation are distributed unevenly across economic sectors [9].

The results should also be interpreted within a broader institutional and macroeconomic context. During the study period, Indonesia implemented several digital transformation initiatives, including the Making Indonesia 4.0 roadmap and the National Digital Economy Strategy [8]. These policies facilitated technology adoption, digital investment, and workforce modernization, thereby accelerating labor market transformation. At the same time, macroeconomic conditions such as inflationary pressures, post-pandemic economic recovery, labor supply adjustments, and changing consumer demand may also have



influenced wage dynamics independently of digitalization. Therefore, wage restructuring should be viewed as the result of interactions between technological advancement and broader economic conditions.

From a theoretical perspective, this study contributes to the literature by demonstrating that wage restructuring in the digital era is a multidimensional process. The findings simultaneously support the propositions of Skill-Biased Technological Change Theory, Human Capital Theory, and Labor Market Segmentation Theory. This suggests that changes in wage structures are shaped by interactions among technological innovation, workforce capabilities, and institutional labor market arrangements. The present findings are also consistent with recent international evidence published between 2023 and 2025. The ILO (2024) reports that digital labour platforms continue to expand globally while increasing income volatility and employment insecurity among platform workers. Similarly, the IMF (2024) argues that the rapid adoption of artificial intelligence is expected to increase productivity and wage premiums for highly skilled workers while creating adjustment pressures for routine occupations. Furthermore, the OECD Employment Outlook (2024) emphasizes that digital transformation increasingly rewards workers with advanced technological competencies, thereby widening wage inequality when opportunities for digital skill acquisition remain uneven. These international findings reinforce the empirical evidence obtained in this study, suggesting that Indonesia experiences similar structural changes in labor wage formation during the acceleration of the digital economy [14–16].

Beyond confirming established theories, the present study extends the current literature by demonstrating that digital transformation influences wage structures through multiple interconnected mechanisms rather than a single channel. Specifically, the findings suggest that digital economy acceleration simultaneously increases the demand for digital skills, expands platform-based employment, and reinforces wage differentiation across service subsectors. This integrated perspective complements recent international studies (2023–2025), which increasingly emphasize that the labor market consequences of digital transformation depend on the interaction between technological adoption, workforce capabilities, and institutional arrangements rather than technological change alone. Therefore, this study contributes to the emerging literature by providing empirical evidence from Indonesia, a rapidly growing digital economy where evidence on wage structure reconfiguration remains relatively limited.

Overall, the acceleration of the digital economy has generated both opportunities and challenges for Indonesia's service sector. While digitalization creates higher-paying employment opportunities and supports economic modernization, it also risks widening wage disparities and reinforcing labor market segmentation. These findings highlight the



importance of implementing inclusive labor policies, expanding digital skills training programs, strengthening worker protection mechanisms, and ensuring broader access to digital opportunities so that the benefits of digital transformation can be distributed more equitably across society.

## 5. Conclusions

This study demonstrates that the acceleration of the digital economy has become an important driver of wage structure transformation within Indonesia's service sector. The findings indicate that digital economy acceleration contributes not only to higher wage growth in technology-intensive service industries but also to increasing wage disparities between workers with different skill levels. These results support the theoretical propositions of Skill-Biased Technological Change (SBTC) and Human Capital Theory, which suggest that technological progress disproportionately benefits workers possessing advanced digital competencies and educational qualifications [3,4,13].

Beyond its contribution to wage growth, digital transformation has altered the composition of labor demand by increasing the economic value of digital skills and shifting employment opportunities toward technology-oriented occupations. Consequently, wage reconfiguration in the service sector should be understood not merely as a change in wage levels but as a broader structural adjustment affecting labor market segmentation, income distribution, and employment security.

These findings are consistent with recent international evidence suggesting that digital economy acceleration increasingly rewards workers possessing advanced digital competencies while simultaneously widening wage disparities when digital skills and technological access remain unequally distributed [14–16]. Therefore, policies promoting inclusive digital skill development and adaptive labor market institutions are becoming increasingly important for ensuring equitable outcomes from digital transformation.

From a policy perspective, the findings suggest the need for more targeted interventions to ensure that the benefits of digitalization are distributed more equitably. First, government agencies should expand digital upskilling and reskilling programs, particularly for workers in traditional service industries vulnerable to technological displacement. Second, labor regulations should be adapted to address the growing prevalence of platform-based employment by strengthening social protection mechanisms, income security provisions, and employment rights for gig workers. Third, policies aimed at reducing regional digital disparities should be prioritized to support a more inclusive digital transformation process across Indonesia.



Several limitations should be acknowledged. The analysis focuses exclusively on DKI Jakarta, which represents the most digitally advanced region in Indonesia and therefore may not fully reflect labor market conditions in other provinces. In addition, the use of aggregated secondary data limits the ability to capture individual-level wage dynamics and worker heterogeneity.

Future research should extend the geographical scope by incorporating multiple provinces with varying levels of digital development. The use of micro-level labor force data and longitudinal datasets would allow for a more comprehensive examination of wage inequality, occupational mobility, and the long-term effects of digitalization on labor market outcomes. Further studies may also explore the moderating roles of gender, age, educational attainment, and industrial characteristics in shaping wage structures within the digital economy.

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