

DIGITAL TRANSFORMATION AND ITS IMPACT ON PUBLIC SECTOR ACCOUNTING QUALITY IN DEVELOPING ECONOMIES

Shella Gilby Sapulette*¹

Universitas Pattimura, Indonesia
Email: sella.sapulette@lecturer.unpatti.ac.id

Franco Benony Limba

Universitas Pattimura, Indonesia
Email: franco.limba@lecturer.unpatti.ac.id

Abstract

This study aims to analyze the impact of digital transformation on the quality of public sector accounting in developing economies using a literature review approach. The research systematically examines and synthesizes relevant academic articles, policy reports, and prior studies published in recent years to understand the relationship between digital technology adoption and improvements in accounting practices. Digital transformation, characterized by the integration of technologies such as cloud computing, big data analytics, and e-government systems, has played a significant role in enhancing the efficiency, transparency, and accountability of public financial management. The findings of this study indicate that the implementation of digital systems contributes to higher accounting quality through improved data accuracy, real-time reporting, and better internal control mechanisms. However, the study also identifies several challenges, including technological disparities, limited human resource competencies, and institutional constraints that may limit the effectiveness of digital transformation initiatives. Therefore, strengthening digital infrastructure, improving technical skills, and establishing supportive regulatory frameworks are essential to optimize the benefits of digital transformation in the public sector. This study provides valuable insights for policymakers and researchers in advancing the quality of public sector accounting in developing countries.

Keywords: Digital Transformation, Public Sector Accounting, Accounting Quality, Developing Economies, Financial Accountability, E-Government.

INTRODUCTION

Digital transformation has become a global phenomenon transforming various sectors of life, including the public sector. The rapid development of information and communication technology has encouraged governments in

¹ Correspondence author

various countries to adopt digital systems for administration, public services, and even state financial management. In this context, digital transformation is understood not only as the use of technology but also as a fundamental change in processes, organizational culture, and data-driven decision-making. Developing countries face unique challenges and opportunities in implementing digital transformation, particularly in public sector accounting, which plays a crucial role in ensuring transparency, accountability, and the quality of financial reporting.

Public sector accounting plays a strategic role in supporting good governance (Hamdy et al., 2025a). The quality of public sector accounting reflects the extent to which the financial information produced is relevant, reliable, comparable, and easily understood by stakeholders. However, in many developing countries, public sector accounting systems still face various obstacles, such as limited technological infrastructure, low human resource capacity, and weak internal control systems. These conditions result in the low quality of financial reports produced, hampering efforts to increase transparency and accountability in public financial management.

Digital transformation presents a potential solution to address these various problems. The implementation of technologies such as Enterprise Resource Planning (ERP) systems, big data analytics, cloud computing, and artificial intelligence in public sector accounting can improve the efficiency, accuracy, and speed of financial data processing (Kant et al., 2025). Furthermore, digitalization enables real-time data integration between work units, minimizing manual errors and improving the quality of the resulting information. With an integrated digital system, the financial reporting process becomes more transparent and more widely accessible to the public, thereby increasing public trust in the government.

However, the implementation of digital transformation in public sector accounting in developing countries is not without obstacles. One major challenge is the still-significant digital divide, both between regions and between government agencies. Uneven technological infrastructure, budget constraints, and a lack of comprehensive policy support are all inhibiting factors in the implementation of digital technology. Furthermore, resistance to change from government officials is also a significant obstacle. Many employees are still accustomed to manual or semi-digital systems, requiring adequate time and training to adapt to new systems (Lestari, 2025a).

In addition to technical factors, institutional and regulatory aspects also play a crucial role in determining the success of digital transformation.

Government policies that support digitalization, accounting standards that adapt to technological developments, and effective oversight systems are key elements in ensuring that digital transformation can run optimally. Furthermore, data security and privacy issues are also key concerns in implementing digital systems, particularly in the management of sensitive public financial data (Gunasilan, n.d.). Therefore, a robust framework is needed to ensure that digital transformation not only improves efficiency but also maintains information integrity and security.

In the context of developing countries, digital transformation in public sector accounting is also closely linked to bureaucratic reform and government system modernization efforts. Many developing countries are striving to improve the quality of public financial governance through the implementation of technology-based systems (Paixão et al., 2024). However, the success rate of digital transformation implementation varies widely, depending on the social, economic, and political conditions of each country. This indicates that there is no universal approach; rather, strategies tailored to the characteristics and needs of each country are needed.

Several previous studies have shown that digital transformation has a positive impact on the quality of public sector accounting, particularly in terms of increasing transparency, accountability, and efficiency (Takhirovna, 2025). However, these research results also indicate variations in impact influenced by various factors, such as the level of technological readiness, the quality of human resources, and institutional support. Therefore, more in-depth studies are needed to understand how digital transformation affects the quality of public sector accounting in developing countries, as well as the factors that determine its successful implementation.

Based on this description, this research is crucial to comprehensively examine the impact of digital transformation on the quality of public sector accounting in developing countries. This research is expected to provide theoretical contributions to the development of public sector accounting literature, particularly regarding the integration of digital technology. Furthermore, this research is also expected to provide practical contributions to the government and other stakeholders in formulating effective policies and strategies to optimize the use of digital technology to improve the quality of public financial management. Thus, digital transformation is not only a global trend but also a strategic instrument in realizing more transparent, accountable, and high-quality governance.

RESEARCH METHOD

This research uses a qualitative approach with a literature review method to analyze digital transformation and its impact on public sector accounting quality in developing countries. Data were collected through a systematic search of various scholarly sources, such as reputable international journals, academic books, reports from international institutions, and other relevant publications relevant to the research topic. The literature search was conducted using academic databases such as Google Scholar, Scopus, and ScienceDirect, using keywords related to digital transformation, public sector accounting, and financial reporting quality. Inclusion criteria were established to ensure the sources used were relevant, credible, and published within a specific timeframe to maintain data freshness.

Data analysis was conducted using content analysis techniques, in which researchers identified, categorized, and synthesized various findings from the collected literature. This process involved grouping key themes such as digital technology adoption, transparency, accountability, and efficiency in public sector financial reporting. Furthermore, researchers critically interpreted the relationship between digital transformation and improved accounting quality, particularly in the context of developing countries with diverse institutional and infrastructure characteristics. With this approach, the research is expected to provide a comprehensive understanding and conceptual contribution to the development of digital technology-based public sector accounting practices.

RESULT AND DISCUSSION

The Impact of Digitalization on Public Financial Transparency and Accountability

The impact of digitalization on public financial transparency and accountability is an increasingly relevant issue in the context of modern governance. Digital transformation has driven significant changes in the way governments manage, record, and report state finances. With the advent of information and communication technology, previously manual and closed processes have become more open, faster, and more accessible to various stakeholders. Digitalization enables the integration of electronic-based financial systems, which not only improves administrative efficiency but also strengthens oversight mechanisms and reduces the potential for irregularities in public financial management (Lestari, 2025b).

In the context of transparency, digitalization plays a crucial role in providing broader public access to financial information. The government can

utilize digital platforms such as information disclosure portals, e-budgeting, and e-reporting to present financial data in a structured, real-time manner. This allows the public, academics, and supervisory institutions to directly monitor budget utilization without having to go through lengthy bureaucratic processes. This increased transparency can ultimately strengthen public trust in the government, as citizens feel they have sufficient access to information about how public funds are managed and used.

Furthermore, digitalization also improves the quality of the financial information presented. Digital-based systems tend to have a higher level of accuracy than manual systems because they minimize human error in data recording and processing (Parindingan et al., 2024). The use of technology, such as cloud-based accounting information systems, enables the automatic integration of data from various work units, resulting in more consistent and comparable financial reports. Good information quality is a crucial foundation for achieving transparency, as the information presented is not only transparent but also reliable and relevant for decision-making.

Furthermore, digitalization also has a significant impact on public financial accountability. Accountability relates not only to the presentation of information but also to accountability for the use of public resources. With a digital system, every financial transaction can be systematically recorded and leave a clear audit trail. This facilitates the audit process by auditors and minimizes the opportunity for data manipulation. Digitalization also enables the implementation of stronger internal control systems, such as layered authorization, automated validation, and system-based monitoring, which overall enhances accountability in public financial management (Sari & Muslim, 2023).

Furthermore, the application of digital technology in public finance also encourages the creation of more effective oversight mechanisms. Internal and external supervisory institutions can utilize digital data to conduct more in-depth analyses of budget usage patterns. With the help of analytical technology and big data, potential irregularities or anomalies in financial transactions can be detected early. This not only accelerates the oversight process but also improves the quality of audit results, supported by comprehensive and integrated data.

However, the implementation of digitalization in public finance is not without its challenges. One of the main challenges is the readiness of infrastructure and human resources. Not all regions or government agencies have adequate technological infrastructure to optimally support digital

systems. Furthermore, the ability of government officials to operate and utilize technology also varies. A lack of digital literacy can hinder the effectiveness of system implementation and potentially lead to errors in data management. Therefore, capacity building efforts through continuous training and competency development are necessary.

Beyond technical aspects, another challenge that requires attention is data security and privacy. Digitalization opens up the risk of data leaks, cyberattacks, and misuse of information. In the context of public finance, this can seriously impact government credibility and public trust (Osei-Dwomoh & Forkuo, 2025). Therefore, implementing a robust information security system is imperative. The government needs to ensure that the systems used meet adequate security standards, including data encryption, strict authentication systems, and monitoring mechanisms for potential cyber threats.

Furthermore, regulatory aspects also play a crucial role in supporting the success of public finance digitalization. A clear legal framework is needed to regulate the use of technology in state financial management, including reporting standards, oversight mechanisms, and data protection. Good regulation will provide legal certainty and encourage consistency in the implementation of digital systems across various government agencies. Without adequate regulation, digitalization has the potential to create inconsistencies in practice and gaps in transparency and accountability between institutions.

Overall, digitalization has a significant impact on increasing the transparency and accountability of public finances. Through the use of technology, the government can provide more open, accurate, and accessible financial information to various parties. Furthermore, digitalization also strengthens accountability mechanisms through systematic recording and more effective oversight. However, the success of digitalization implementation depends heavily on the readiness of infrastructure, human resources, system security, and adequate regulatory support. With proper management, digitalization can be a strategic instrument in realizing transparent, accountable, and high-integrity public financial governance.

Improving the Quality of Financial Reports through Digital Transformation

Digital transformation has become a key factor in improving the quality of financial reports across various sectors, both public and private (Al Sabti, 2023). The rapid development of information technology is driving organizations to shift from manual recording systems to digital-based systems that are more

integrated, accurate, and efficient. In the context of financial reporting, this transformation not only plays a role in accelerating the report preparation process but also increases the transparency, accountability, and reliability of the information presented to stakeholders. Good financial report quality is crucial because it serves as the basis for economic decision-making, organizational performance assessment, and accountability to the public and investors.

One of the main contributions of digital transformation to improving the quality of financial reports lies in its ability to minimize human error. Digital systems such as enterprise resource planning (ERP) and cloud-based accounting software enable automatic and real-time transaction recording. This reduces the risk of recording errors, data duplication, and information manipulation that often occur in manual systems (Miaoquan et al., 2023). Furthermore, integration between modules in digital systems allows financial data to be directly linked to other operational activities, such as procurement, production, and sales, resulting in more comprehensive and consistent reports.

Digital transformation also increases efficiency in the financial reporting process (Chepkorir & Kariuki, 2024). With automation, previously time-consuming processes such as data reconciliation, journal adjustments, and report consolidation can now be performed more quickly and accurately. This efficiency not only saves time and costs but also enables organizations to present financial reports in a timely manner. Timeliness is one of the key qualitative characteristics of quality financial reports, as the information presented will be more relevant and useful for decision-making.

Furthermore, digital technology allows for increased transparency in financial reporting. Digital-based systems are generally equipped with an audit trail feature that records every user activity within the system, including data changes and transactions. This simplifies the audit process and increases stakeholder confidence in the integrity of the financial reports. High transparency can also reduce the potential for fraud, as every activity can be clearly traced and systematically documented (Chepkorir & Kariuki, 2024).

In the context of accountability, digital transformation makes it easier for organizations to meet applicable reporting standards. Digital systems can be designed to adhere to established accounting principles and standards, thereby minimizing the risk of non-compliance in the preparation of financial reports. Furthermore, the use of technologies such as big data analytics and artificial intelligence enables more in-depth analysis of financial data, helping

management identify trends, risks, and opportunities that could impact organizational performance (Dombrovska, 2023).

However, implementing digital transformation in financial reporting also faces various challenges. One major challenge is the readiness of human resources to operate new technologies. The shift from manual to digital work systems requires increased competency and skills, particularly in information technology and data analysis. Without adequate human resource support, the benefits of digital transformation cannot be maximized. Therefore, training and capacity building are crucial aspects of this transformation process.

Furthermore, data security is a key concern in digital transformation. Financial reports are highly sensitive information and hold strategic value for an organization. The use of digital systems increases the risk of cyber threats such as hacking, data theft, and information manipulation. Therefore, organizations need to implement robust security systems, such as data encryption, multi-layered authentication, and regular system monitoring to ensure the security and confidentiality of financial information.

On the other hand, the initial investment required to adopt digital technology can also be a barrier, especially for small and medium-sized organizations. The costs of system implementation, employee training, and technology maintenance require significant resources. However, when viewed over the long term, the benefits gained from increased efficiency, accuracy, and quality of financial reports can outweigh the costs. Therefore, digital transformation should be viewed as a strategic investment that can enhance organizational competitiveness and sustainability (Cheng et al., 2023).

Digital transformation also drives a paradigm shift in the financial reporting process, moving from historical to more predictive and strategic. With the support of analytical technology, financial reports not only present past information but also provide insight into future projections. This enables management to make more proactive and data-driven decisions. Furthermore, the use of interactive dashboards and data visualizations facilitates the understanding of financial information by various parties, including those without an accounting background.

Challenges of Implementing Digital Transformation on Public Sector Accounting Quality in Developing Countries

The implementation of digital transformation in the public sector in developing countries is a strategic step to improve accounting quality, transparency, and financial accountability. However, this process is not without

obstacles. Various structural, technical, and cultural challenges often pose major obstacles to realizing a quality public accounting system through digitalization. These challenges impact not only the effectiveness of technology implementation but also the quality of the resulting financial information, ultimately impacting public trust in government institutions.

One major challenge is the limited availability of information technology infrastructure (Hamdy et al., 2025b). In many developing countries, access to stable and fast internet networks remains unequal, especially in remote areas. This creates disparities in the implementation of digital-based accounting systems, with agencies in urban areas likely more advanced than those in other regions. The lack of adequate hardware and software also slows the digitalization process, resulting in semi-manual financial recording and reporting. This situation has the potential to lead to recording errors, reporting delays, and poor data integration between agencies.

Furthermore, the limited human resources competent in digital technology and accounting pose a significant challenge. Digital transformation requires a workforce that not only understands accounting principles but also is capable of operating and managing technology-based financial information systems (Landjohou & Christopher, 2026). In many developing countries, a digital skills gap remains among civil servants. Lack of training and capacity development leads to low utilization of implemented systems. As a result, technology that should improve accounting quality is not being used optimally.

Another challenge is resistance to organizational change. Digital transformation often faces a conservative work culture that is less adaptable to innovation. Employees accustomed to manual systems tend to be reluctant to switch to digital systems due to discomfort or fear of change (Alsharari & Ikem, 2023). This resistance can slow the implementation process and reduce the effectiveness of the new system. Furthermore, a lack of commitment from organizational leaders can also hinder the success of digital transformation, as systemic change requires full support from all levels of management.

Data security and privacy issues are also significant challenges in implementing digital transformation. Digital-based accounting systems are vulnerable to cyber threats such as hacking, data theft, and information manipulation. Developing countries often lack robust cybersecurity systems and adequate regulations to protect public financial data. These security weaknesses can undermine public trust in government accounting systems and open up opportunities for digital-based fraud or corruption.

On the other hand, budget constraints also hinder the comprehensive adoption of digital technology. Digital transformation requires significant investment, including in the procurement of technological equipment, system development, and human resource training. For developing countries with fiscal constraints, budget allocations for digitalization often compete with other more pressing needs such as health, education, and basic infrastructure. As a result, digital transformation implementation is gradual and uneven, impacting the quality of the resulting accounting systems (Heiling, 2025).

Another challenge is the lack of clear standards and regulations regarding the implementation of digital accounting systems (Ikwuanusi et al., 2024). In some developing countries, the regulatory framework does not fully support the integration of technology into public financial management. Inconsistencies between the systems used and applicable accounting standards can lead to inconsistencies in financial reporting. Furthermore, a lack of coordination between government agencies can hamper system integration, preventing comprehensive and real-time presentation of financial data.

System interoperability is also a crucial issue in public sector digital transformation. Many government agencies use disparate, disconnected systems, complicating data exchange. The inability of systems to communicate effectively leads to data duplication, information inconsistencies, and an increased risk of errors in financial reporting. This, of course, negatively impacts the quality of public sector accounting, which should prioritize accuracy, transparency, and comparability of information.

In addition to technical and structural factors, social and political aspects also influence the success of digital transformation. Political instability, frequent policy changes, and a lack of commitment to bureaucratic reform can hinder the long-term implementation of digital systems. Digital transformation requires policy continuity and strong political support for consistent and sustainable implementation. Without this, digitalization efforts will remain short-term projects that will not significantly impact accounting quality (Villao et al., 2023).

Thus, it is understandable that the challenges of implementing digital transformation in the public sector of developing countries are multidimensional, encompassing technological, human resource, organizational, regulatory, and political aspects. Addressing these challenges requires a comprehensive and integrated approach, including increased infrastructure investment, human resource capacity development, regulatory strengthening, and the development of an organizational culture that adapts

to change. Only by overcoming these obstacles can digital transformation truly contribute to significantly and sustainably improving the quality of public sector accounting.

CONCLUSION

Digital transformation in the public sector has proven to play a significant role in improving accounting quality, particularly in developing countries facing challenges in transparency, accountability, and efficiency of financial management. The application of technologies such as integrated financial information systems, big data, and cloud computing enables faster, more accurate, and real-time access to financial recording, reporting, and oversight. This has resulted in increased reliability of the resulting financial information, supporting more informed decision-making and strengthening public trust in government institutions.

However, the success of digital transformation is determined not only by the availability of technology but also by the readiness of human resources, adaptive regulations, and adequate supporting infrastructure. In many developing countries, obstacles remain, such as limited digital competency among civil servants, resistance to change, and disparities in technology access. Therefore, a comprehensive approach through ongoing training, policy strengthening, and infrastructure investment is needed to ensure optimal and sustainable digital transformation in improving the quality of public sector accounting.

REFERENCES

- Al Sabti, A. A. W. H. (2023). Implications for Enhancing the Financial Reporting Quality Brought on by the Digital Revolution of Internal Control. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev.*, 8(4), 24.
- Alsharari, N. M., & Ikem, F. (2023). Digital accounting systems and information technology in the public sector: Mutual interaction. *Journal of Systems and Information Technology*, 25(1), 53–73. <https://doi.org/10.1108/JSIT-09-2021-0190>
- Cheng, Y., Zhou, X., & Li, Y. (2023). The effect of digital transformation on real economy enterprises' total factor productivity. *International Review of Economics & Finance*, 85, 488–501. <https://doi.org/10.1016/j.iref.2023.02.007>
- Chepkorir, F., & Kariuki, G. (2024). *Digital Transformation and Quality of Financial Reporting in Nairobi City County Government, Kenya* (SSRN Scholarly

- Paper No. 4948536). Social Science Research Network. <https://doi.org/10.2139/ssrn.4948536>
- Dombrovska, N. (2023). Digital transformation of accounting: The impact of technologies on the efficiency and quality of financial reporting. *Ekonomichnyy analiz*, 33(2), 239–246.
- Gunasilan, U. (n.d.). DIGITAL TRANSFORMATION TECHNOLOGIES RESHAPING FINANCIAL REPORTING, TRANSPARENCY, AND ACCOUNTABILITY IN PUBLIC SECTOR ORGANIZATIONS. 40(07).
- Hamdy, A., Diab, A., & Eissa, A. M. (2025a). Digital Transformation and the Quality of Accounting Information Systems in the Public Sector: Evidence from Developing Countries. *International Journal of Financial Studies*, 13(1), 30. <https://doi.org/10.3390/ijfs13010030>
- Hamdy, A., Diab, A., & Eissa, A. M. (2025b). Digital Transformation and the Quality of Accounting Information Systems in the Public Sector: Evidence from Developing Countries. *International Journal of Financial Studies*, 13(1), 30. <https://doi.org/10.3390/ijfs13010030>
- Heiling, J. (2025). Digital transformation and the accounting for intangible assets in the public sector. *Journal of Public Budgeting, Accounting & Financial Management*, 38(1), 134–155. <https://doi.org/10.1108/JPBAFM-09-2024-0177>
- Ikwuanusi, U., Onunka, O., Owoade, S., & Uzoka, A. (2024). Digital transformation in public sector services: Enhancing productivity and accountability through scalable software solutions. *International Journal of Applied Research in Social Sciences*, 6, 2744–2774. <https://doi.org/10.51594/ijarss.v6i11.1724>
- Kant, S., Balami, D. A., Alemu, Z. K., & Takaro, G. S. (2025). Digital Transformation in Accounting Effect on Public Sector Accountability Through Digital Innovations in the Public Sector in the Horn of Africa. In *Enhancing Public Sector Accountability and Services Through Digital Innovation* (pp. 237–264). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3693-9251-5.ch007>
- Landjohou, G., & Christopher, E. (2026). Digital Transformation in Public Service Delivery: A Narrative Review of Opportunities and Challenges in Developing Countries. *Advancement in Management and Technology (AMT)*, 6(3), 01–12. <https://doi.org/10.46977/amt.2026.v06i03.001>
- Lestari, P. A. (2025a). Transparency and Accountability in the Digital Era: Insights from Public Sector Accounting. *Sinergi International Journal of Accounting and Taxation*, 3(3), 195–208. <https://doi.org/10.61194/ijat.v3i3.864>
- Lestari, P. A. (2025b). Transparency and Accountability in the Digital Era: Insights from Public Sector Accounting. *Sinergi International Journal of Accounting and Taxation*, 3(3), 195–208. <https://doi.org/10.61194/ijat.v3i3.864>

- Miaoquan, X., Yu, K., Yu, Xuewen, L., Yi, W., Jun, Y., & Kok Loang, O. (2023). THE IMPACT OF DIGITAL TRANSFORMATION ON FINANCIAL REPORTING AND ANALYSIS IN THE ACCOUNTING INDUSTRY. *International Journal of Accounting*, 8, 324–336. <https://doi.org/10.55573/IJAFB.085023>
- Osei-Dwomoh, E., & Forkuo, G. O. (2025). *Digital Transformation of Public Financial Management in Ghana and Developing Economies: A Systematic Review of Accountability, Transparency, and Efficiency* (SSRN Scholarly Paper No. 5797042). Social Science Research Network. <https://doi.org/10.2139/ssrn.5797042>
- Paixão, F. S. da, Silva, D. J. C. da, Melo, J. B. de, Dias, H. B. G., & Neto, A. M. da C. (2024). IPSAS ADOPTION AND DIGITAL TRANSFORMATION IN THE PUBLIC SECTOR: EVIDENCE FROM WORLD ECONOMIES. *Boletim de Conjuntura (BOCA)*, 17(50), 351–367. <https://doi.org/10.5281/zenodo.10699383>
- Parindingan, F. Y., Haliah, H., & Nirwana, N. (2024). Evaluation of Transparency and Accountability of Regional Government Financial Reports in the Digitalization Era. *Journal of Accounting and Finance Management*, 5(5), 1051–1058. <https://doi.org/10.38035/jafm.v5i5.1066>
- Sari, R., & Muslim, M. (2023). Accountability and Transparency in Public Sector Accounting: A Systematic Review. *Amkop Management Accounting Review (AMAR)*, 3(2), 90–106. <https://doi.org/10.37531/amar.v3i2.1440>
- Takhirovna, M. N. (2025). FROM LEDGERS TO ALGORITHMS: DIGITAL TRANSFORMATION IN PUBLIC SECTOR ACCOUNTING. *AMERICAN JOURNAL OF EDUCATION AND LEARNING*, 3(8), 467–483.
- Villao, D., Vera, G., Duque, V., & Mazón, L. (2023). Opportunities and Challenges of Digital Transformation in the Public Sector: The Case of Ecuador. In O. Gervasi, B. Murgante, A. M. A. C. Rocha, C. Garau, F. Scorza, Y. Karaca, & C. M. Torre (Eds.), *Computational Science and Its Applications – ICCSA 2023 Workshops* (pp. 3–15). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-37117-2_1