HUMAN RESOURCE MANAGEMENT | RESEARCH ARTICLE

Evaluating Public Service Performance in Food Safety Certification: The Role of Human Resource Competence, Information Technology, and Process Transparency at BBPOM Bandar Lampung, Indonesia

Sri Wulan Mega[1], Arif Sugiono[2], Andi Wijaya[3]

[1, 2, 3] Program Studi Magister Ilmu Administrasi Publik, Universitas Terbuka, Indonesia.
Email: sriwulanmega@gmail.com[1] , arifsugiono01@gmail.com[2] , Andiwijaya1973@gmail.com[3]

ABSTRACT
This study aims to evaluate the simultaneous influence of human resource competence, the utilization of information technology, and process transparency on public service performance, particularly in the certification of Good Processed Food Production Methods (CPPOB) at the Food and Drug Supervisory Agency (BBPOM) in Bandar Lampung, Indonesia. Responding to increasing public demands for food safety and the complexity of certification services, this research investigates how administrative and technological factors shape institutional performance. A quantitative approach was employed, involving 275 respondents who had accessed CPPOB certification services. Multiple linear regression analysis was conducted to measure the effect of each independent variable. The findings reveal that all three variables significantly influence public service performance, with human resource competence contributing the most ($\beta = 0.313$), followed by information technology ($\beta = 0.152$) and process transparency ($\beta = 0.147$). The study provides both theoretical and practical implications. Theoretically, it reinforces the discourse of public service delivery based on good governance and public value management. The results highlight the importance of institutional strategies focusing on employee training, digital infrastructure development, and transparent service procedures. These findings contribute to public sector reform efforts in Indonesia, particularly in enhancing responsiveness, efficiency, and accountability in food safety supervision.

Keywords: Human Resource Quality, Information Technology, Transparency, Public Service, CPPOB Certification, BBPOM, Good Governance.
JEL Code: H83, O33, J24.

I. Introduction

The integrity of food supply chains and safeguarding public health are critically dependent on robust food safety certification processes (Ahmed et al., 2023). This necessity has led to the establishment of intricate regulatory frameworks and certification bodies tasked with ensuring that food products meet stringent safety standards from farm to consumer (AM, 2019). The globalized nature of food production and distribution

further amplifies this challenge, necessitating harmonized international standards and efficient oversight mechanisms to prevent foodborne illnesses and maintain consumer trust (Uyttendaele et al., 2015). Consequently, the effectiveness of public service performance in food safety certification is paramount, directly influencing public health outcomes and economic stability (Pacholczyk-Sienicka, 2024). This research delves into the multifaceted dimensions that underpin the efficacy of such public services, specifically examining the pivotal roles of human resource competence, information technology, and process transparency in shaping the outcomes of food safety certification within the public sector. A comprehensive understanding of these factors is crucial for optimizing the operational efficiency and reliability of certification agencies, thereby enhancing their capacity to enforce evolving food safety regulations (Cho & Hooker, 2008). This inquiry is particularly pertinent given the increasing complexity of food matrices and the accelerating pace of technological innovation within the agri-food sector. This study endeavors to bridge current knowledge gaps by systematically analyzing how improvements in these three areas—human resource competence, advanced information technology, and enhanced process transparency—can collectively elevate the standard of public food safety certification performance, thereby contributing to broader public health security and sustained consumer confidence.

Furthermore, this investigation acknowledges that an effective food safety culture, underpinned by strong leadership and organizational commitment, is integral to successfully implementing certification standards (Pai et al., 2024). Despite the growing international awareness of foodborne diseases and the escalating complexity of food supply chains, many nations still contend with insufficient enforcement mechanisms and a dearth of appropriate microbiological criteria for food products (Lee et al., 2023) (Acedo et al., 2024) (Pérez-Lavalle et al., 2020). This deficiency often results in significant public health risks and substantial economic burdens (Oh et al., 2025; Tibebu et al., 2024). Recognizing this, there is a global consensus that robust information systems are essential for enhancing food safety levels, refining regulatory frameworks, and decreasing the incidence of foodborne diseases (Lakner et al., 2021). The increasing complexity of agricultural supply chains and growing concerns over food authenticity and sustainability further underscore the urgent need for reliable information regarding food provenance and production practices (Cordeiro & Ferreira, 2025). Therefore, ensuring the competence of human resources involved in food safety certification, leveraging advanced information technologies, and fostering transparent processes are critical for mitigating risks and building consumer trust in a rapidly evolving global food landscape (Xi et al., 2021).

This paper aims to elucidate how these elements collectively contribute to a more resilient and effective food safety certification system, ultimately safeguarding public health and facilitating equitable trade practices. This study will therefore systematically evaluate the interplay between these critical components, providing actionable insights for policymakers and practitioners aiming to enhance food safety governance. Specifically, this research will assess how the synergistic integration of highly skilled personnel, cutting-edge digital infrastructure, and clear operational procedures can optimize the effectiveness and credibility of public food safety certification bodies. By analyzing empirical data and drawing upon established theoretical frameworks, this paper seeks to develop a comprehensive model that elucidates how these factors influence certification outcomes, providing a robust foundation for future policy development and strategic interventions. This comprehensive approach is vital for addressing the inherent challenges of food safety management, which increasingly demands a holistic perspective beyond traditional transactional elements to encompass organizational culture and continuous adaptation (Manning et al., 2019). Given these challenges, the practical application of information technology is increasingly recognized as a cornerstone for modernizing food safety systems, enabling real-time data analysis and enhancing traceability across complex supply chains (Li et al., 2014; Liu & Gao, 2017). This integration is crucial for rapid incident response and proactive risk management, allowing for anticipating and mitigating potential food safety hazards before they escalate. For instance, advancements in IoT sensors and devices offer continuous monitoring capabilities throughout food production and distribution, providing immediate data to prevent contamination and ensure compliance with safety standards (Witjaksono et al., 2018). Furthermore, blockchain technology can

significantly enhance the transparency and immutability of food safety data, providing an auditable trail for every stage of the food supply chain and fostering greater stakeholder accountability (Astill et al., 2019). Such digital innovations facilitate robust traceability systems, essential for promptly identifying and isolating contaminated products, thereby minimizing public health risks (Oh et al., 2025).

Public service is a tangible manifestation of the state's presence in fulfilling the needs of its citizens. In modern governance, the quality of public services must not only adhere to the principles of efficiency and effectiveness but also embody accountability, transparency, and openness. The digital era has further accelerated the demand for bureaucratic transformation to deliver faster, more accessible, and adaptive services in response to public needs. Improving public service performance has become a critical agenda in Indonesia's bureaucratic reform, particularly in technical services such as food safety certification. High-quality public service is a key indicator of successful modern governance. In an era marked by digitalization and growing demands for transparency, public institutions are expected to deliver efficient, accountable, and responsive services. According to Tahir (2011), implementing public services must uphold the principles of good governance to maintain public trust in governmental institutions. One example of a strategic service is the certification of Good Processed Food Production Methods (CPPOB), carried out by the Food and Drug Supervisory Agency (BBPOM) in Bandar Lampung. This certification is vital in ensuring food safety and quality, particularly for Micro, Small, and Medium Enterprises (MSMEs), which significantly contribute to the local food industry. Despite the digitalization support for CPPOB (Good Processed Food Production Methods) services, various obstacles persist. Yuliana and Saputra (2023) indicate that human resource competence and digital systems significantly affect service speed and effectiveness; however, process transparency has been insufficiently explored, although it is critical for ensuring accountability in service delivery. Field evidence also reveals limitations in human resource capacity, low technological literacy, and a lack of procedural openness. These three factors point to structural barriers impeding optimal public service performance.

Previous studies by Burhanudin & Dewi (2024) and Anisa & Ahyaruddin (2024) underscore the importance of human resource quality and information technology in enhancing government agency performance. Nevertheless, integrative examinations that simultaneously incorporate the role of process transparency alongside these two variables—specifically within the context of technical certification services—remain very limited. This study aims to evaluate the influence of human resource competence, utilization of information technology, and process transparency on public service performance in the CPPOB certification services at BBPOM Bandar Lampung. The findings are expected to reinforce public service models grounded in good governance and provide practical recommendations for strengthening the capacity of technical government service delivery.

II. Literature Review and Hypothesis Development

2.1. Public Administration Theory

Public administration is a subfield of social science that studies government governance and public service delivery. It can be defined as activities undertaken by government bodies or officials in managing and implementing public policies. Woodrow Wilson (1887), in his classical work The Study of Administration, emphasized that public administration is the implementation of policies determined by politically authorized officials. Wilson viewed administration as separate from politics, focusing on organization and management to enhance government efficiency (Tahir, 2011). In its modern interpretation, Dwight Waldo (1968) argued through The Administrative State that public administration is about managing resources and making decisions and encompasses democratic values, social justice, and collective societal goals (Mufiz, 2024). Relevant theoretical frameworks include:

1. Max Weber's Bureaucracy Theory: Emphasizes hierarchical structure, formal rules, and efficiency.

2. Classical Public Administration (Henri Fayol): Focuses on core management functions—planning, organizing, and controlling.
3. New Public Management (NPM): Adopts private sector principles like performance orientation and efficiency.
4. Good Governance (UNDP, Kaufmann et al.): Highlights transparency, accountability, and public participation.
5. Public Value Management (Mark Moore): Advocates for creating public value through strategic and participatory service delivery.

2.2. Public Service Theory

Public service is defined as activities performed by the government or public institutions to meet the needs of the people. According to Law No. 25 of 2009, public service includes the provision of goods, services, and administrative processes managed by service providers. Key principles include:

1. Transparency and accountability
2. Efficiency and effectiveness
3. Fairness and inclusiveness
4. Responsiveness to public needs

This framework explains how personnel competence, technological systems, and procedural transparency influence public perceptions of service quality—each positioned as a key factor in shaping value-based public service performance.

2.3. Factors Affecting Public Service Quality

Public service quality is influenced by various interrelated factors, such as human resources, budget, clear procedures, leadership, technological advancement, policies, regulations, social conditions, and public expectations (Susanti, 2024). Therefore, continuous improvement is essential for delivering effective and responsive services. The decision to focus on three core factors—Human Resource Quality, Information Technology, and Process Transparency—is strategic and justified by their interconnectedness in building trustworthy and efficient public services:

a. HRM Quality, According to Widodo (2015), quality human resources possess adequate education, training, and experience. Indicators include knowledge, technical skills, teamwork, loyalty, and responsibility. Thus, HR competence is expected to influence service performance through technical mastery and communication ability in CPPOB procedures.
b. Information Technology Utilization, IT is a strategic enabler for accelerating CPPOB services and enhancing accessibility. Mulyadi (2016) notes that IT includes computer systems, software, and networks that support administrative efficiency (Syukur, 2019). Its benefits include:

- Time and cost efficiency
- Increased data accuracy
- Real-time information access

c. Transparency refers to the openness of service providers when sharing information with the public. Grounded in good governance theory, transparency is essential to prevent corruption, build public trust, and ensure accountability in decision-making. Law No. 14 of 2008 on Public Information Disclosure mandates that public bodies provide accurate and accessible information via electronic and non-electronic means.

2.4. Public Service Performance Theory

Public service performance refers to the effectiveness of institutions in meeting public expectations. The theoretical framework employed in this study draws upon the work of Berry & Parasuraman, as cited in Kotler & Keller (2016), which emphasizes how service quality can be measured and enhanced through various dimensions that influence customer experience. In the context of public service delivery, performance encompasses the outcomes achieved, the quality of the processes, and how services are delivered to the public. Berry & Parasuraman developed the SERVQUAL model, which can be applied to assess public service performance. This model identifies five key dimensions as indicators of service quality: reliability, responsiveness, assurance, empathy, and tangibles (Jackxander, 2018). These dimensions form the SERVQUAL (Service Quality) model, which was established through a series of studies conducted across six service sectors: household appliance repair, credit cards, insurance, long-distance telephone services, retail banking, and securities brokerage.

The SERVQUAL model, also widely known as the GAP Analysis Model, is the collaboration among the three prominent service quality experts—A. Parasuraman, Valerie A. Zeithaml, and Leonard L. Berry began in 1983. Their initial contribution was a conceptual paper titled "A Conceptual Model of Service Quality and Its Implications for Future Research," published in the Journal of Marketing. This paper outlines five potential service quality gaps that may contribute to quality issues in service delivery. The SERVQUAL model was designed to assist managers in diagnosing quality-related problems and in identifying strategies to improve service quality. The service expectations of customers, as outlined in the SERVQUAL model, are influenced by past experiences, word-of-mouth communication, personal needs, and the company's marketing communication activities (Mahesa, 2019). Therefore, it can be concluded that the indicators used include:

1. Public satisfaction;
2. Service speed;
3. Compliance of services with established standards;
4. Accountability in service delivery processes.

The previously discussed literature review highlights that the quality of human resources significantly influences improvements in public service performance, information technology utilization, and administrative processes' transparency. Public administration theories such as New Public Management and Good Governance emphasize the importance of efficiency, accountability, and information openness in managing public services. In addition, the theory of Public Value Management reinforces the urgency of creating public value through community engagement and the professionalism of government officials. Prior studies also indicate that each of these three variables contributes significantly to enhancing the effectiveness and efficiency of service delivery. Therefore, this study aims to empirically examine the influence of each factor on public service performance, specifically in the context of the certification service for the implementation of Good Processed Food Production Methods (CPPOB) at the National Agency of Drug and Food Control (Balai Besar POM) in Bandar Lampung. Based on the theoretical foundations and prior empirical studies, the following hypotheses are formulated:

H1:   Human resource competence positively affects public service performance.

H2:   Utilization of information technology has a positive effect on public service performance.

H3:   Process transparency positively affects public service performance.

H4:   Human resource competence, information technology utilization, and process transparency significantly affect public service performance.

Accordingly, based on these relationships, the hypotheses proposed in this study are as follows, in Figure 1.
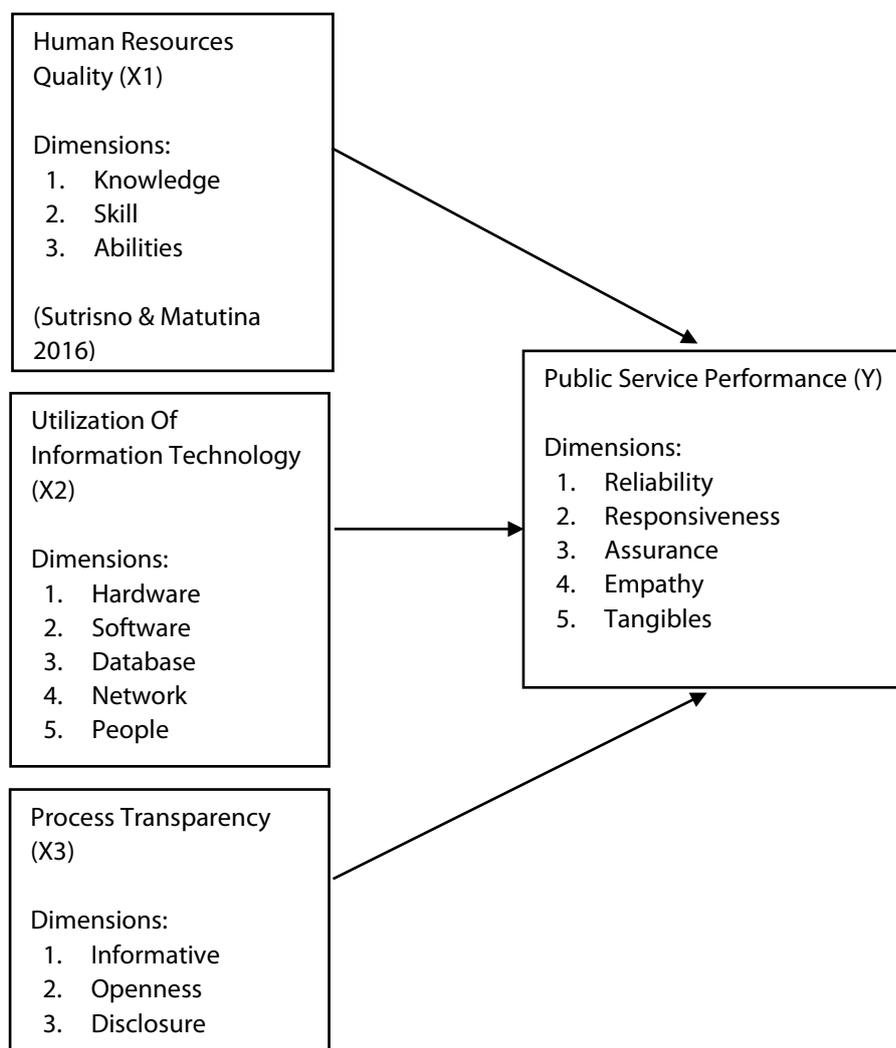
Figure 1. Research Framework

III.   Research Method

3.1.   Type and Approach of the Research

This study adopts a quantitative associative-causal method, examining cause-and-effect relationships among variables. This approach aligns with the research objective of statistically measuring the influence of independent variables on the dependent variable. The study seeks to investigate whether the quality of human resources, the utilization of information technology, and process transparency significantly affect public service performance at the National Agency of Drug and Food Control (Balai Besar POM) in Bandar Lampung. In this context, the variables examined in the study are as follows: X1 = Quality of Human Resources, X2 = Utilization of Information Technology, X3 = Process Transparency, and Y = Public Service Performance. This research is conducted at the National Agency of Drug and Food Control (BBPOM) in Bandar Lampung, with the implementation period spanning from July 2024 to June 2025 (a total duration of 10 months).

3.2.   Data Sources and Data Collection Techniques

The data sources in this study consist of primary data and secondary data:

1.   Primary data were obtained through the distribution of questionnaires to business actors utilizing the processed food product distribution permit certification services at BBPOM Bandar Lampung.
2.   The population in this study comprises business actors who applied for CPPOB certification at BBPOM Bandar Lampung from January to December 2023, totaling 940 actors, based on BBPOM administrative records.
3.   The sample was determined using the Slovin formula with a 5% margin of error, resulting in 275 respondents. This number is considered representative, as it includes various business scales and categories of actors.
4.   Secondary data were obtained from BBPOM performance reports, procedural documents, regulations, scientific articles, and statistical data from official institutions.

Primary data directly represents public perceptions regarding service quality, while secondary data strengthens the analysis by offering a theoretical foundation and relevant contextual information. Combining both data types aims to comprehensively understand the factors influencing public service performance at BBPOM Bandar Lampung.

3.3.   Instrument Validity and Reliability Testing

The research instrument was tested for both validity and reliability prior to deployment:

1.   Validity testing was conducted using the Pearson Product-Moment correlation technique to assess the extent to which questionnaire items accurately measure the intended constructs.
2.   Reliability testing employed the Cronbach's Alpha method, with an alpha coefficient of ≥ 0.60 considered the minimum threshold for reliability

3.4.   Data Analysis Techniques

Once the data were collected, the following classical assumption tests were conducted:

1.   Normality test (Kolmogorov-Smirnov)
2.   Multicollinearity test (using Variance Inflation Factor and Tolerance values)
3.   Heteroscedasticity test (using the Glejser test)

The data were analyzed using multiple linear regression analysis to determine the extent to which the three independent variables, both partially and simultaneously, influence public service performance. The regression equation used is as follows:

$$\hat{Y} = a + b_1 X_1 + b_2 X_2 + b_3 X_3$$

Description:
Y = Dependent variable
X_1, X_2, X_3 = Independent variables
a = Constant
b_1, b_2, b_3 = Regression coefficients for each variable

Further significance testing was conducted using:

1. t-test to examine the partial effect of each independent variable
2. F-test to examine the simultaneous effect
3. Coefficient of Determination (R^2) to determine how much variance in the dependent variable can be explained by the independent variables

All analyses were performed using the latest version of SPSS, which supports accurate and interpretable statistical regression testing.

IV.   Results and Discussion

4.1.   General Description of the Research Object

The Center for Drug and Food Control (BBPOM) in Bandar Lampung is a Technical Implementation Unit (UPT) under the National Agency of Drug and Food Control (BPOM) of the Republic of Indonesia. This institution was established to carry out the tasks and functions of operational technical supervision of drugs and food, as mandated by BPOM Regulation No. 12 of 2018 and No. 22 of 2020. BBPOM in Bandar Lampung plays a central role in overseeing the production facilities, distribution, and circulation of drugs and food within the province of Lampung. Lampung Province is located at the southern tip of Sumatra Island, bordered by South Sumatra and Bengkulu to the north, the Java Sea to the east, the Indian Ocean to the west, and the Sunda Strait to the south. BBPOM in Bandar Lampung oversees a working area that covers 10 out of the total 15 regencies/cities in the province. These areas include Pesisir Barat, Lampung Barat, Lampung Tengah, Tanggamus, Pringsewu, Pesawaran, Lampung Timur, Lampung Selatan, Bandar Lampung City, and Metro City. As an institution responsible for ensuring the safety and quality of drugs and food, BBPOM Bandar Lampung carries out several core tasks, including the following:

1. Formulating supervision plans, programs, and budgets.
2. Inspecting drug and food production and distribution facilities.
3. Certifying products and distribution facilities.
4. Conducting routine and investigative sampling and testing.
5. Preventing legal violations, conducting investigations, and gathering intelligence.
6. Managing complaints, information, education, and cross-sector collaboration.
7. Monitoring distribution activities in the digital realm.
8. Handling institutional administrative and housekeeping affairs.

The execution of these duties is carried out through a systematic and risk-based approach, emphasizing efficiency and accountability in public service delivery. BBPOM in Bandar Lampung faces significant challenges in fulfilling its strategic role, particularly regarding human resources (HR) limitations. Based on the Workload Analysis (Analisis Beban Kerja/ABK), there is a gap between the required and available number of supervisory personnel. Ideally, 119 staff members are needed; however, only 82 are currently available, which accounts for 68.91% of the total requirement. Employee competency is also a significant concern, considering the increasing complexity of regulatory supervision. Therefore, regular knowledge updates are imperative to ensure that personnel remain aligned with the evolving dynamics of policy and technology.

BBPOM Bandar Lampung has adopted a digitalization approach through various application systems to overcome HR constraints and improve service efficiency. One of its flagship innovations is the "Aplikasiku" platform, which is utilized for performance planning, HR management, and evaluation. E-licensing and e-reporting systems have accelerated the process of distribution permit issuance and violation reporting,

enabling the delivery of fast and transparent public services. Furthermore, online communication channels and social media are also leveraged to expand information outreach to the public.

The food sector's micro, Small, and Medium Enterprises (MSMEs) support the local economy. Approximately 70% of the 400,000 MSMEs in Lampung operate in this sector. BBPOM supports them through assistance programs that include the implementation of Good Processed Food Production Practices (Cara Produksi Pangan Olahan yang Baik/CPPOB) and the facilitation of Distribution Permit Numbers (Nomor Izin Edar/NIE). From 2019 to 2023, 111 MSMEs have received assistance, and 276 NIEs have been issued. BPOM Regulation Number 22 of 2021 strengthens the regulatory framework by requiring all processed food business actors to apply for CPPOB Implementation Permits within two years of the regulation's enactment. Within the framework of public accountability, BBPOM Bandar Lampung is subject to an evaluation system for Public Service Implementing Units (Unit Penyelenggara Pelayanan Publik/UPP) as regulated by the Ministry of Administrative and Bureaucratic Reform (Kementerian PANRB). The evaluation covers six aspects of service: Service Policy (30%), HR Professionalism (18%), Facilities and Infrastructure (15%), Information Systems (15%), Consultation and Complaints (15%), and Innovation (7%). In 2024, BBPOM achieved a performance score of 99.80% in the timely completion of certification assessment decisions from 988 applications, although the ideal target was 100%. BBPOM in Bandar Lampung provides nine primary types of services, namely:

1. Issuance of Import and Export Certificates for Drugs and Food Products.
2. Certification of Good Drug Distribution Practices (CDOB).
3. Certification of Good Traditional Medicine Manufacturing Practices (CPOTB) and Good Cosmetics Manufacturing Practices (CPKB).
4. Issuance of CPPOB Implementation Permits.
5. Laboratory Testing of Drugs and Food Products.
6. Public Complaint Services and Access to Public Information.

4.2.   Statistical Result

Among all the services provided, the Implementation Permit for Good Processed Food Production Practices (CPPOB) is the most in-demand service, particularly among Micro, Small, and Medium Enterprises (MSMEs) in the food sector. The following section presents the research respondents, who consist of a total of 275 individuals:

Table 1. Characteristics of Respondents

Respondent Characteristics	Category	f	%
Gender	Woman	188	68.37
	Man	87	31.64
Age	21–30	87	31.6
	31–40	48	17.5
	> 41	140	50.9
Last education	Senior High School	79	28.7
	Associate Degree	57	20.7
	Bachelor's Degree	113	41.1
	Master's degree	26	9.5

Table 1 explains that A total of 275 respondents participated in this study. Most were female (68.37%) and over 41 (50.9%). Regarding education, 41.1% of respondents held a bachelor's degree, reflecting a relatively high level of understanding regarding the importance of CPPOB certification and quality public services. These characteristics strengthen the validity of respondents' perceptions toward the research

variables. This study also employed index analysis to measure respondents' perceptions of the following variables:

- Human Resources Quality (X1): Average score of 239.7 (categorized as very good)
- Information Technology (X2): Average score of 224.4 (categorized as very good)
- Process Transparency (X3): Average score of 223.5 (categorized as very good)
- Public Service Performance (Y): Average score of 202.9 (categorized as very good)

These results indicate that BBPOM's performance is perceived as very good by MSME actors, although aspects such as empathy and the modernity of facilities still require improvement. The initial step in analyzing the research findings is conducting validity and reliability testing of the research instruments. Based on the results of the validity test presented in Table 3.1, all indicators under the variables of Human Resource Quality (X1), Utilization of Information Technology (X2), Process Transparency (X3), and Public Service Performance (Y) show r-calculated values greater than the r-table value (0.3). This indicates that all indicators are valid and appropriate for model testing.

Table 2. Reliability

Variable	Cronbach's Alpha	Critical Point	Information
Human Resources Quality (X1)	0.923	0.7	Reliable
Utilization of Information Technology (X2)	0.957		
Process Transparency (X3)	0.940		
Public Service Performance(Y)	0.964		

Based on Table 2, all the indicators under variables X1, X2, X3, and Y have r-calculated values greater than 0.3, indicating instrument validity. Cronbach's Alpha values for each variable exceed 0.7 (X1 = 0.923; X2 = 0.957; X3 = 0.940; Y = 0.964), demonstrating a high level of reliability. Before conducting multiple regression analysis, classical assumption tests were performed as prerequisites to ensure the validity of the regression model.

4.2.1. The Normality Test shows a significant value of 0.061 (> 0.05), indicating that the data are typically distributed.

Table 3. Normality Test

One-Sample Kolmogorov-Smirnov Test			
			Unstandardized Residual
N			275
Normal Parameters[a,b]		Mean	.0000000
		Std. Deviation	.37914530
Most Extreme Differences		Absolute	.053
		Positive	.048
		Negative	.053
Test Statistic			.053
Asymp. Sig. (2-tailed)			.061
a. Test distribution is Normal.			
b. Calculated from data.			
c. Liliefors Significance Correction.			

4.2.2. Heteroscedasticity Test using the Spearman Rank Correlation indicates no heteroscedasticity problem, as all significance values are above 0.05, except for one, which is very close (0.037), but still within the acceptable tolerance threshold.

Table 4: Heteroscedasticity Test

Correlations			
			Unstandardized Residual
Spearman's rho	Human Resources Quality	Correlation Coefficient	.061
		Sig. (2-tailed)	.315
		N	275
	Utilization of Information Technology	Correlation Coefficient	.126
		Sig. (2-tailed)	.037
		N	275
	Process Transparency	Correlation Coefficient	.112
		Sig. (2-tailed)	.063
		N	275

4.2.3. The multicollinearity test was conducted to determine whether there is a high linear correlation among the independent variables in the regression model. The analysis results show that the Variance Inflation Factor (VIF) values for all independent variables are below the threshold of 10, as follows:

Table 5. Test for Multicollinearity

Coefficients[a]			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Human Resources Quality	.431	2.319
	Utilization of Information Technology	.356	2.808
	Process Transparency	.357	2.799
a. Dependent Variable: Public Service Performance			

a. Normality Test: A significance value of 0.061 (> 0.05) indicates that the data are typically distributed.
b. Heteroscedasticity Test: All significance values are above 0.05, indicating the absence of heteroscedasticity.
c. Multicollinearity Test: The Variance Inflation Factor (VIF) values for X1 (2.319), X2 (2.808), and X3 (2.799) are all below the threshold of 10, indicating that multicollinearity is not present.

The regression model applied in this study is formulated as follows:

$$Y = 1{,}110 + 0{,}313X1 + 0{,}152X2 + 0{,}147X3$$

Interpretation of the coefficients:

a. X1 (Human Resource Quality) has a positive and statistically significant effect on Y (Public Service Performance), with a t-value of 4.549 and a significance level of 0.000.
b. X2 (Utilization of Information Technology) also has a positive and significant effect on Y, with a t-value of 2.543 and a significance level of 0.012.
c. X3 (Process Transparency) has a positive and significant effect on Y, with a t-value of 2.148 and a significance level of 0.033.

These positive regression coefficients indicate that all three independent variables positively influence the dependent variable.

4.2.4. Simultaneous Test (F-Test)

a. The calculated F-value of 59.915 is greater than the F-table value of 2.638, with a significance level of 0.000. This result indicates a statistically significant simultaneous effect.
b. The correlation coefficient (R) is 0.631.
c. The coefficient of determination (R^2) is 0.399, or 39.9%.

This indicates that the calculated F-value (59.915) exceeds the critical value (2.638), with a significance level below 0.05, confirming that Human Resource Quality, Utilization of Information Technology, and Process Transparency simultaneously significantly influence Public Service Performance.

4.2.5. Partial Test (t-Test)

a. Human Resource Quality (X1) yields a t-value of 4.549 with a significance level 0.000. Since this value is below 0.05, it can be concluded that X1 has a significant partial effect on Y.
b. Utilization of Information Technology (X2) produces a t-value of 2.543 and a significance level of 0.012 (< 0.05), indicating a significant effect on Y.
c. Process Transparency (X3) has a t-value of 2.148 with a significance level of 0.033, indicating a significant effect on Y.

Accordingly, the partial hypotheses for all three independent variables are accepted, as they all significantly influence Public Service Performance. In addition, the researcher conducted correlation and determination analyses for the research object as follows:

1. The correlation coefficient (R) of 0.631 indicates a strong relationship between the independent and dependent variables.
2. The coefficient of determination (R^2) of 0.399, or 39.9%, suggests that Human Resource Quality, Utilization of Information Technology, and Process Transparency collectively explain 39.9% of the variation in Public Service Performance. The remaining 60.1% is influenced by other factors not examined in this study.

The analysis results indicate that all independent variables tested in this research significantly contribute to improving public service performance, particularly in the context of the certification process for implementing Good Processed Food Production Methods (CPPOB) at the BBPOM in Bandar Lampung. Human Resource Quality emerged as the most dominant factor affecting performance, followed by utilizing Information Technology and Process Transparency. These findings suggest that in a technical and bureaucratic public service setting, such as CPPOB certification, the competence and capacity of human resources are critical in ensuring the effectiveness and efficiency of service delivery. Information technology also plays a vital role in accelerating processes and minimizing errors in administrative and technical procedures. In contrast, process transparency enhances public and business trust in service quality.

4.3. Discussion

The research findings indicate that all three independent variables contribute to improving public service performance, particularly in the CPPOB certification services. Human Resource Quality emerged as the dominant factor, underscoring the importance of staff training and capacity development (Tahir, 2011; Alfi, 2020). The utilization of information technology has had a significant influence on process efficiency; however, the "people" dimension remains the primary weakness. This aligns with the theory proposed by Sutarman (2019) and the study by Siregar (2018), which emphasize the critical role of human readiness in the success of digital implementation. Process Transparency also contributes positively to service performance, although improvements in information openness are still necessary. This finding is consistent with Mardiasmo's theory

(2018) and the study by Harahap (2020), both of which highlight the importance of information accessibility in enhancing public accountability. These three variables align with the SERVQUAL model by Parasuraman et al., which emphasizes the importance of reliability, responsiveness, and quality assurance in public service delivery. Based on respondents' characteristics, the majority were women over 41 with a bachelor's degree as their highest educational attainment, indicating they possess the experience and educational background to comprehend the importance of CPPOB certification. Their knowledge and experience enrich their perspectives on the roles of Human Resource Quality, the Utilization of Information Technology, and Process Transparency in improving public service performance.

The measurement results of the Human Resource Quality variable indicate very positive perceptions, especially regarding knowledge and openness to new learning. Although the dimensions of skills and abilities were also rated very good, loyalty and teamwork still require improvement. Meanwhile, the Utilization of Information Technology variable was also assessed positively, particularly regarding database access. However, the "people" dimension shows weaknesses, notably employees' lack of technological skills. This suggests a need for targeted training to optimize the use of technology in public service delivery. The average score for the Process Transparency variable also falls within the "outstanding" category, particularly regarding informativeness. However, openness remains a challenge, especially in providing easily accessible and consistent information to the public. This is crucial to strengthening public trust in service institutions. Furthermore, the performance of public services in the CPPOB certification was assessed as very good, with service reliability emerging as the highest-rated dimension. Nevertheless, the organization must maintain quality consistency across all aspects of service—such as responsiveness and customer satisfaction—to preserve public trust and loyalty.

The regression analysis results indicate a strong relationship between human resource quality, information technology, transparency, and public service performance, with a correlation coefficient (R) of 0.631. Meanwhile, the coefficient of determination (R^2) of 39.9% suggests that these three variables significantly contribute to explaining public service performance, although other factors outside the model influence 60.1% of the variation. These findings emphasize that integrating these three aspects is essential for enhancing the quality of public services. They also underscore the need for strategic efforts in human resource development, technology optimization, and the continuous improvement of transparency systems.

4.3.1. The Effect of Human Resource Quality on the Performance of Public Services in the Licensing Certification of Good Processed Food Production Practices (CPPOB)

Research findings consistently indicate that human resources (HR) quality is a dominant factor influencing public service performance at the Food and Drug Supervisory Agency (BBPOM) in Bandar Lampung, particularly in the CPPOB certification process. The average index for the HR quality variable falls within the "outstanding" category, with the knowledge dimension achieving the highest score (256.2), followed by skills (245.4) and ability (231.7). This indicates that most employees possess a strong theoretical and technical understanding of their service-related duties. However, the ability dimension reveals that organizational loyalty and teamwork skills still require improvement, particularly in managing complex issues and coordinating across functions. While technical knowledge and skills are relatively high, interpersonal and collaborative capabilities must be strengthened as integral components of comprehensive HR quality.

Statistically, the validity and reliability of the HR quality measurement instruments were found to be excellent. All questionnaire items had correlation coefficients (r-count) greater than the critical value (r-table), while the internal reliability measured by Cronbach's Alpha reached 0.923—well above the minimum threshold of 0.7. The data also passed classical assumption tests, including normality, heteroscedasticity, and multicollinearity, confirming its suitability for regression analysis. Regression results show that HR quality significantly affects public service performance, with a t-value of 4.549 exceeding the critical value of 1.969 and a significance value of 0.000. These findings support the hypothesis that the higher the HR quality within public service institutions, the better the service performance perceived by the public.

Theoretically, these results affirm previous academic studies. Sutrisno and Matutina (2016) emphasized that knowledge, skills, and personal competence in public organizations are key determinants in ensuring efficient, timely, and error-free service delivery. In CPPOB certification—which demands high technical standards and regulatory compliance in food safety—HR quality is crucial in determining the accuracy and credibility of service outcomes. Furthermore, Alfi (2020) and Fitriani (2019) argued that systematic capacity development of HR is a fundamental pillar in maintaining sustainability and effectiveness in public service delivery, especially in strategic sectors such as health and food. Managerial initiatives at BBPOM Bandar Lampung—such as mandatory annual training of at least 20 instructional hours, competency-based staff rotation, and structured performance evaluations—demonstrate consistency between field practices and those theoretical principles.

Previous empirical studies also support these findings. Wijaya et al. (2018) found that work units actively engaged in HR training and development exhibited superior public service performance compared to those less engaged in capacity building. Sundari (2019) showed that high-quality HR accelerates service processes, reduces administrative errors, and enhances public satisfaction. Prasetyo and Nugroho (2020) further emphasized the importance of technical and managerial competencies to ensure that public services remain adaptive to changing needs and dynamic societal expectations. From the public administration perspective, these findings also find relevance within New Public Management (NPM) and Human Capital Theory frameworks. NPM emphasizes the importance of efficiency, accountability, and result-oriented approaches as core principles of modern public service. Achieving high-quality service outcomes can only be realized if institutions are equipped with competent human resources who are adaptive to change and capable of working within systems that demand high efficiency. Human Capital Theory considers human resources a strategic asset that must be developed and managed continuously. Training, skill-based rotation, and fair performance evaluation systems improve technical performance and strengthen employee loyalty, foster a collaborative work environment, and enhance public perception of government service quality.

Empirically, the research findings reflect the increasingly complex reality of public service at BBPOM Bandar Lampung. The rising demand for CPPOB certification due to the growth of the processed food industry in Lampung requires the institution to be prepared to address both technical and regulatory challenges. Employees are expected to understand food quality and safety standards and respond to regulatory dynamics, the readiness to digitalize the service process, and the growing public expectations. In this context, the quality of human resources becomes a key pillar in bridging the gap between public needs and institutional capacity.

4.3.2. The Influence of Information Technology Utilization on the Improvement of Public Service Performance

This study demonstrates that the utilization of information technology (IT) has made a significant contribution to enhancing public service performance, particularly in the process of Certification for the Implementation of Good Processed Food Production Practices (CPPOB) at the National Agency of Drug and Food Control (BBPOM) in Bandar Lampung. With an average index score of 224.4, public perceptions regarding the presence and use of technology indicate a positive trend. This reflects that the digital transformation adopted by BBPOM in its certification service processes has yielded tangible impacts in terms of operational efficiency, service speed, transparency, and the accuracy of information. However, it is important to note that among the five dimensions used to assess IT utilization—hardware, software, database, network, and people—there is a variation in scores that reflects relative strengths and weaknesses. The database dimension recorded the highest score, indicating that BBPOM's data management system has effectively provided rapid and accurate access to information supporting the certification process. This is crucial, as the quality of public services is primarily determined by an institution's ability to store, process, and present data efficiently. On the other hand, the "people" dimension received the lowest score (191.6), indicating that the main challenge lies in the technical capabilities of employees to operate and optimally

utilize the technology. This condition underscores that the success of digitalized public services depends on technology availability and human resources readiness.

Statistical results support these conclusions. Validity and reliability tests show that all measurement items are appropriate and reliable, with a Cronbach's Alpha value of 0.957. Classical assumption tests confirm that the data meet the requirements for multiple linear regression. The regression analysis results show a t-value of 2.543 (greater than the t-table value of 1.969), with a significance value of 0.012 (< 0.05), indicating that IT utilization has a significant effect on service performance improvement. In other words, the more optimally information technology is used, the better the public service performance perceived by service users.

These findings are reinforced by the theory of Sutarman (2019), which posits that the effectiveness of information technology in public organizations depends on five key components: hardware, software, database, network, and people. This theory provides a framework suggesting that the success of IT implementation requires synergy among these elements. In the context of BBPOM Bandar Lampung, although infrastructure aspects (hardware, software, and database) are functioning well, limitations in the "people" aspect—or employees' digital competencies—remain an obstacle in fully optimizing the potential of technology. This aligns with the theory that humans remain the key actors in digital systems; technology can only be an effective tool when supported by competent users who are adaptive to change.

These findings are also consistent with previous studies. Siregar (2018) found that IT utilization significantly contributes to team member work efficiency and improved service speed. Wijaya et al. (2020) stated that IT can reduce administrative burdens, accelerate business processes, and minimize errors in public services. Furthermore, electronic information systems in certification services enable previously manual processes—highly prone to human error—to be conducted more systematically, transparently, and measurably. This also contributes to increasing public trust in government institutions, a critical indicator in evaluating service performance. From a broader perspective, utilizing information technology (IT) in public services represents the modernization of bureaucratic tools. It reflects a paradigm shift in administrative practice—from conventional approaches to digital governance. Digitalization of services is not merely a system transformation, but also a transformation of values: from a slow bureaucracy to a fast and efficient organization; from procedural to adaptive; from opaque to transparent. However, as emphasized by Human-Technology Interaction theory, the successful integration of technology in public services largely depends on the cognitive, affective, and skill-based capacities of the personnel operating it.

Therefore, although BBPOM Bandar Lampung has succeeded in building a robust service information system, the digital transformation cannot be considered complete unless the enhancement of digital competencies among employees accompanies it. The digitalization process must be supported by continuous training, technical mentoring, and an evaluation system that assesses human resource adaptability to technological developments. IT is not a substitute for humans but a work partner; thus, a human-centered approach in designing and implementing information systems is crucial.

4.3.3. The Influence of Transparency on the Improvement of Public Service Performance

This study indicates that process transparency (X3) significantly affects the performance of public services in the CPPOB certification process at BBPOM Bandar Lampung. Transparency was measured through nine items, yielding an average index score of 223.5. The informativeness dimension obtained the highest score (237), reflecting the clarity of the information provided. However, the openness dimension scored the lowest among the three assessed dimensions, although it still falls within the "outstanding" category. This suggests that while public information access has been implemented effectively, there remains room to improve the consistency and accessibility of information for the public.

Statistically, the measurement instrument proved valid (r-calculated > r-table) and highly reliable, with a Cronbach's Alpha value of 0.940. Classical assumption tests confirmed that the data are typically distributed, free from heteroscedasticity and multicollinearity. The regression analysis results further reinforce

that transparency significantly influences service performance, with a t-value of 2.148 > 1.969 and a significance level of 0.033 (< 0.05). This implies that the higher the process transparency, the better the performance of public services will be. These findings align with Mardiasmo's theory (2018), which emphasizes that transparency—through clarity of information, openness, and disclosure—builds public trust and strengthens institutional accountability. In the BBPOM context, the openness of information regarding procedures, criteria, and certification results has enhanced public participation and satisfaction. This study is also consistent with the findings of Harahap (2020) and Sundari (2021), who found that transparency supports public service effectiveness and prevents potential administrative deviations.

Practically, BBPOM Bandar Lampung has applied the principles of transparency by publishing procedures, certification results, and performance reports that are accessible to the public, including through its official website. However, improving real-time information availability and developing a more in-depth disclosure system—particularly regarding activities, achievements, and public funds- is necessary to enhance service quality further. By expanding information access and strengthening the public information system, BBPOM can sustainably enhance trust, legitimacy, and service performance.

4.3.4. The Simultaneous Influence of Human Resource Quality, Information Technology Utilization, and Process Transparency on the Performance of Public Services in the Certification of Good Processed Food Production Practices (CPPOB)

The variable of Public Service Performance in the CPPOB certification at BBPOM Bandar Lampung was measured through 22 indicators covering the dimensions of reliability, responsiveness, and customer satisfaction. The average index score indicated an "outstanding" category, with the highest value in the reliability dimension (221.4), reflecting that services have been delivered consistently and by service commitments. The dimensions of responsiveness and customer satisfaction also demonstrated good performance, although there remains room for improvement in the consistency of overall service quality. These results emphasize the importance of continuous innovation and evaluation to maintain and enhance the quality of services received by the public. Simultaneously, Human Resource Quality, Information Technology Utilization, and Process Transparency variables significantly influence public service performance. The F-test result showed an F-count of 59.915, substantially higher than the F-table value of 2.638, with a significance level of < 0.05, indicating that the regression model is statistically valid and significant. The correlation coefficient (R) 0.631 reflects a strong relationship between the independent and dependent variables. The coefficient of determination (R^2) value of 39.9% indicates that the contribution of these three variables to public service performance is substantial, while other factors beyond this model influence the remaining 60.1%.

External factors affecting service performance include: dynamic policies/regulations, limited infrastructure and facilities, organizational culture, employee job satisfaction, monitoring systems, and public participation. These findings underscore the need for a systemic approach to improve public services comprehensively. The results also support Parasuraman's SERVQUAL model, wherein:

a. Human Resource Quality correlates with the dimensions of reliability, responsiveness, assurance, and empathy;
b. Information Technology contributes to tangibles and reliability;
c. Process Transparency supports assurance and empathy by providing precise and publicly accessible information.

Accordingly, the three variables interact to form a foundation for public services that are responsive, efficient, and accountable. The positive interaction between employee competence, technological readiness, and information openness results in services that are faster, more accurate, and more trusted by the public.

This study aligns with the findings of Pratama et al. (2020) and Saputra (2019), which assert that a combination of HR competencies, IT utilization, and transparency significantly enhances the effectiveness and competitiveness of the public sector. To achieve sustainable improvements, BBPOM Bandar Lampung must:

a. Strengthening the integration of human resources, information technology, and transparency as the foundation of public service delivery;
b. Comprehensively identifying other external factors that may affect service performance;
c. Promoting digital transformation based on an adaptive organizational work culture;
d. Conducting regular evaluations based on public satisfaction as a feedback mechanism.

V. Conclusion

Based on the research findings, it can be concluded that the Quality of Human Resources (HR), Utilization of Information Technology (IT), and Process Transparency each have a significant influence on the Performance of Public Services in the Certification Process of Good Processed Food Production Practices (CPPOB) at BBPOM Bandar Lampung. Competent, skilled, and professional human resources have proven to enhance the accuracy and precision of service delivery. Likewise, the effective use of information technology accelerates processes, reduces manual errors, and improves efficiency and access to information. Transparency of processes—which includes openness of information, clarity of procedures, and institutional accountability—also fosters increased public satisfaction and trust in the services provided. Simultaneously, these three variables collectively exert a strong influence on the improvement of public service performance. The F-test result demonstrates a significant value (F-calculated 59.915 > F-table 2.638), with a coefficient of determination (R^2) of 39.9%, indicating that the variables of HR quality, IT utilization, and transparency can explain 39.9% of the variation in public service performance. The remaining 60.1% is influenced by other factors outside the model, such as policy dynamics, organizational culture, employee motivation, infrastructure, and community participation. These findings emphasize that improving public services requires a holistic approach and should not rely solely on one aspect. The SERVQUAL model's three variables significantly contribute to the five key dimensions of service quality: reliability, responsiveness, assurance, empathy, and tangibles. This study reinforces that excellent public service can only be achieved if institutions consistently manage HR quality, utilize IT effectively, and embed transparency throughout the service process. Therefore, strengthening the integration of these three variables should be a key strategy for BBPOM Bandar Lampung in realizing public services that are fast, accurate, transparent, and trustworthy.

References

Acedo, A., Absulio-Morales, W. L., Franco, R., Ekman, J., Bradbury, M., & Tan, D. K. Y. (2024). Food safety of fresh fruits and vegetables in the Philippines: challenges and prospects. Food Research, 8(6), 96. https://doi.org/10.26656/fr.2017.8(6).298

Ahmed, A. I., Zaki, M., & Tager, A. (2023). Analyzing the food safety management programs (HACCP /ISO 22000) implemented in hotels. International Journal of Tourism and Hospitality Management, 6(1), 168. https://doi.org/10.21608/ijthm.2023.300851

AM, S. (2019). Food safety – a key to healthy life. Journal of Nutritional Health & Food Engineering, 9(1). https://doi.org/10.15406/jnhfe.2019.09.00320

Anisa, R., & Ahyaruddin, M. (2024). Pengaruh Teknologi Informasi, Kualitas Sumber Daya Manusia, Dan Pengendalian Internal Terhadap Kinerja Instansi Pemerintah Di Kabupaten Kampar. EKOMA : Jurnal Ekonomi, 4(1), 100-120.

Astill, J., Dara, R., Campbell, M., Farber, J. M., Fraser, E. D. G., Sharif, S., & Yada, R. Y. (2019). Transparency in food supply chains: A review of enabling technology solutions [Review of Transparency in food supply chains: A review of enabling technology solutions]. Trends in Food Science & Technology, 91, 240. Elsevier BV. https://doi.org/10.1016/j.tifs.2019.07.024

Burhanudin, I., & Dewi, L. A. (2024). Kualitas Sumber Daya Manusia Sebagai Faktor Pendorong Kinerja Karyawan Pada Kantor Desa Singajaya Kecamatan Cihampelas. ATRABIS Jurnal Administrasi Bisnis (e-Journal), 10(1), 97-106.

Cho, B., & Hooker, N. H. (2008). Comparing food safety standards. Food Control, 20(1), 40. https://doi.org/10.1016/j.foodcont.2008.01.011

Cordeiro, M., & Ferreira, J. C. (2025). Beyond Traceability: Decentralised Identity and Digital Twins for Verifiable Product Identity in Agri-Food Supply Chains. Applied Sciences, 15(11), 6062. https://doi.org/10.3390/app15116062

Jackxander, N. (2018). 'Analisis Tingkat Kepuasan Konsumenterhadap Kualitas Pelayanan Pt. Spc Salimah Food Studi Kasus: Jabodetabek. Jurnal Administrasi Publik, 1290.

Lakner, Z., Plasek, B., Kasza, G., Kiss, A., Soós, S., & Temesi, Á. (2021). Towards Understanding the Food Consumer Behavior–Food Safety–Sustainability Triangle: A Bibliometric Approach. Sustainability, 13(21), 12218. https://doi.org/10.3390/su132112218

Lee, J. C., Neonaki, M., Alexopoulos, A., & Varzakas, T. (2023). Case Studies of Small-Medium Food Enterprises around the World: Major Constraints and Benefits from Implementing Food Safety Management Systems. Foods, 12(17), 3218. https://doi.org/10.3390/foods12173218

Li, D. X., Zhang, Y. H., & Dai, Y. W. (2014). The Application of Computer Information Technology in Food Safety. Applied Mechanics and Materials, 5881. https://doi.org/10.4028/www.scientific.net/amm.556-562.5881

Liu, Y., & Gao, H. (2017). System Analysis for the Traceability and Logistics Management of Fresh Agricultural Products Supply Chain. https://doi.org/10.2991/mse-17.2017.26

Mahesa, R. R. (2019). Analisis Kualitas Pelayanan Terhadap Kepuasan Nasabah Menggunakan Metode Service Quality (Studi Kasus: Pt. Bank Mandiri, Duri-Pinggir, Riau). UNES Law Review, 125–140.

Manning, L., Luning, P. A., & Wallace, C. A. (2019). The Evolution and Cultural Framing of Food Safety Management Systems—Where From and Where Next? Comprehensive Reviews in Food Science and Food Safety, 18(6), 1770. https://doi.org/10.1111/1541-4337.12484

Mufiz, M. A. (2024). Pengantar Ilmu Administrasi Negara. Jakarta: Universitas Terbuka.

Oh, S. E., Kim, J., Kim, J.-Y., & Ahn, J. H. (2025). Food Safety Distribution Systems Using Private Blockchain: Ensuring Traceability and Data Integrity Verification. Foods, 14(8), 1405. https://doi.org/10.3390/foods14081405

Pacholczyk-Sienicka, B. (2024). Crimes Against Food: Characteristics, Health Risk, and Regulations. Food and Energy Security, 13(5). https://doi.org/10.1002/fes3.70002

Pai, A., Jaiswal, S., & Jaiswal, A. K. (2024). A Comprehensive Review of Food Safety Culture in the Food Industry: Leadership, Organizational Commitment, and Multicultural Dynamics [Review of A Comprehensive Review of Food Safety Culture in the Food Industry: Leadership, Organizational Commitment, and Multicultural Dynamics]. Foods, 13(24), 4078. Multidisciplinary Digital Publishing Institute. https://doi.org/10.3390/foods13244078

Pérez-Lavalle, L., Carrasco, E., & Valero, A. (2020). Microbiological criteria: Principles for their establishment and application in food quality and safety. Italian Journal of Food Safety, 9(1). https://doi.org/10.4081/ijfs.2020.8543

Susanti, M. H. (2024, November 21). Kualitas Sumber Daya Manusia Terhadap Pelayanan Publik Pada Dinas Pekerjaan Umum Kabupaten Tanah Bumbu'. Retrieved from UNIKOM.

Syukur, R. M. (2019, 23 November). Pengaruh Teknologi Informasi Terhadap Kualitas Sistem Informasi Akuntansi Yang Berdampak Pada Kualitas Laporan Keuangan (Survei Pada Kantor Pemerintahan Desa Yang Terdapat Di Kabupaten Majalengka). Retrieved 2024, from UNIKOM: http://elibrary.unikom.ac.id>

Tahir, A. (2011). Kebijakan Publik Dan Transparansi Penyelenggaraan Pemerintahan Daerah,. Jakarta: Grafindo.

Tibebu, A., Tamrat, H., & Bahiru, A. (2024). Review: Impact of food safety on global trade [Review of Review: Impact of food safety on global trade]. Veterinary Medicine and Science, 10(5). Wiley. https://doi.org/10.1002/vms3.1585

Uyttendaele, M., Franz, E., & Schlüter, O. (2015). Food Safety, a Global Challenge. International Journal of Environmental Research and Public Health, 13(1), 67. https://doi.org/10.3390/ijerph13010067

Witjaksono, G., Rabih, A. A. S., Yahya, N. bt, & Alva, S. (2018). IOT for Agriculture: Food Quality and Safety. IOP Conference Series Materials Science and Engineering, 343, 12023. https://doi.org/10.1088/1757-899x/343/1/012023

Xi, X., Wei, S., Lin, K., Zhou, H., Wang, K., Zhou, H., Zhao, L., Nan, N., Qiu, L., Hu, F., Tsai, F.-S., & Chen, D. (2021). Digital Technology, Knowledge Level, and Food Safety Governance: Implications for National Healthcare System. Frontiers in Public Health, 9. https://doi.org/10.3389/fpubh.2021.753950

Yuliana, & Saputra, D. (2023). Pengaruh Kompetensi SDM dan Digitalisasi terhadap Efektivitas Pelayanan Publik di DPMPTSP Kota Palembang. Public Administration Review, 11(2), 145-159.