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PERFORMANCE MEASURES FOR THE VILLAGE ADMINISTRATION: SEM-BASED CROSS VALIDATION STUDY

Zaitul Zaitul[1], Desi Ilona[2], Neva Novianti[3], Suamperi[4], Amran Rasli[5]

[1, 3, 4] Universitas Bung Hatta; Jalan Sumatera Ulak Karang, Padang, 25133, Indonesia.
[1] DBA, Professor at the Faculty of Economics and Business;
zaitul@bunghatta.ac.id; ORCID: 0000-0001-6454-9657;
[2] Ph.D., Associate Professor at the Faculty of Economics, Universitas Ekasakti;
Jalan Veteran Dalam No. 26B, Padang, 25113, Indonesia;
desiilona@unespadang.ac.id; ORCID: 0000-0001-6152-7293 *(corresponding author)*;
[3] Master of Accounting, Senior Lecturer at the Faculty of Economics and Business;
nevanovianti@bunghatta.ac.id, ORCID: 0000-0003-0551-5487
[4] Doctor, Senior Lecturer at the Faculty of Law;
suamperi@bunghatta.ac.id; ORCID: 0000-0003-4067-5320;
[5] Ph.D., Professor at the Faculty of Business and Communication,
INTI International University, Nilai, Malaysia;
amran.rasli@newinti.edu.my; ORCID: 0000-0002-4847-4614

Abstract. This study develops the performance measures for the village administration, the lowest tier of government in Indonesia's government hierarchy. Data was collected through the survey, and two hundred nineteen useful questionnaires were analysed. The exploratory factor analysis (EFA) was conducted using the Statistical Package for Social Science (SPSS). The results of EFA were then validated using confirmatory factor analysis by applying the structural equation modeling-partial least square (SEM-PLS) method. Based on the literature review, we identified twenty-six performance measures. The result reveals four factors of village administration performance, i.e., society, learning and growth, internal monitoring mechanism, and external monitoring mechanism. This study has several limitations, particularly the limited sample and village administration in only one city. Future studies could use more samples and widen the number of villages by combining villages of several towns or regencies. Practically, this finding contributes to the village administration so that this performance measure can be implemented to measure its performance. These performance measures are balanced measures among village society, village administration personnel, village administration human resources, and internal and external monitoring agencies. This study also has social implications in that the village community can assess the vil-

lage administration's performance as the performance measures have a societal dimension. This is the first study developing performance measure for village administration. However, previous studies failed to pay attention to performance measurement development for village administration, the lowest tier of government in Indonesia.

Keywords: performance measure, village administration, Indonesia.

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Introduction

Many countries' low-level governments have suffered from central power and the inability to develop their competency in implementing modern reform factors (Hamied and Elbagoury, 2022). The low-tier government's social environment and politics make performance management more complex than in the private sector (Hoque, 2014). Although performance management began in the private sector, it quickly spread to the public sector, including hospitals, municipalities, universities, and other public institutions (Dimitropoulos, Kosmas and Loannis, 2017). The performance measures in a public sector organisation are unique due to the variety of relevant stakeholders of public sector organisations in contrast to the profit-oriented organisation (Hood, 1991). Particularly, the public sector is administered to achieve results by employees' and enhance their managerial abilities and ensure improved planning goals and service for citizens (Anderson and Klaassen, 2012; Conaty, 2012). Performance measurement quantifies the effectiveness and efficiency of activity; it is the periodical measurement of improvement toward obvious short-run and long-run goals and the declaration of outcomes to decision-makers to improve programme performance (Neely, Gregory and Platts, 1995).

Performance measurement is a key tool for an organisation to quantify its actions and give feedback on the management process to find the best idea for future performance (Logotri, 2003). Performance measurement systems (PMS) are expected to generate incentives that arrange in line with individual aims with an organisation's goals, supply worth response on the advancement towards these objectives, and establish the basis for external and internal accountability (Caval-

luzzo and Ittner, 2004). However, performance measurement systems are mostly used by public sector organisations to suit the attributes of their actions and surpass those that fail to meet the standards (Speklé and Verbeeten, 2014). In addition, Dimitropoulos, Kosmas and Loannis (2017) argue that a customary applied system most appropriate for controlling performance in public sector organisations is the balanced scorecard. Several public organisations have utilised a balanced scorecard (BSC) with important results on their day-to-day operations and general performance. The BSC is a performance management structure popular worldwide (Rompho, 2020). According to Perkins, Grey and Remmers (2014), the BSC looks like one of the most dominant concepts in performance measurement and management (PMM). BSC was subsequently expanded into the framework of strategic management, which assists organisations in converting their strategy into action (Rompho, 2020).

BSC has become extensively applied since its introduction by Kaplan and Norton in 1992 (Fatima and Elbanna, 2020). In addition, Fatima and Elbanna (2020) argue that the academic application of BSC seems to be on equal terms with the private sector to date. BSC can be integrated with the corporate operation's budgeting and planning activities (Keyes, 2005) and reduce information abundance by restricting the total of measures employed and blending non-financial and financial measures into the four previous factors, i.e. financial, customer, internal process, and innovation (Hamied and Elbagoury, 2022). Furthermore, Hamied and Elbagoury (2022) believed that BSC assists managers in recognising, at least indirectly, numerous interrelationships, thereby assisting them in overcoming conventional beliefs about functional blockades and eventually guiding them to improve problem-solving and decision-making. In particular, although some scholars have started to focus on the relevance of BSC to the public sector organisation, such as local governments (Bobe, Mihret and Obo, 2017; Dimitropoulos, Kosmas, and Loannis, 2017; Tanaamah, Hastari, and Tanaem, 2019; Rompho, 2020; Hamied and Elbagoury, 2022), the overall current status of BSC with regards to village administration is unknown. Therefore, this study used exploratory and confirmatory factor analyses to develop the performance measures. We believe this is the first study to establish performance measures for village administration. As such, this study will enrich the literature on performance measurement systems for public sector organisations, such as village administrations.

Literature review

Research context

Villages in Indonesia were mainly regulated by a municipal governance system before the establishment of Indonesia's nation-state (Susan and Budirahayu, 2018). However, Susan and Budirahayu (2018) add that the regime of the New Order (1969–1998) devastated these pre-existing governance formations. Village Law No. 6 of 2014, that more than 75.000 Indonesian villages were awarded the essential budget and authority to begin the new enlargement (Nurlinah, Haryanto, and Sunardi, 2020). The village has a different name in a few areas in Indonesia, such as the *Dusun* and *Marga* in *Palembang* (South Sumatra), the *Nagari* in *Mi-*

nangkabau (West Sumatra), and the *Desa* in Java and *Bali* (Antlöv, 2003). This village government is the lowest level of government in the national administrative ladder (comprising of the village, sub-district, district, provincial, and national levels) (Antlöv, Wetterberg, and Dharmawan, 2016; Zuhriyah et al., 2022).

Following discussions involving the lawmakers, political elites, and village stakeholders, in the *Dewan Perwakilan Rakyat* (Indonesia house of representatives at the national level) endorsed the law of the village No. 6 of 2014 (Susan and Budirahayu, 2018). This law about Villages and their implementation of rules and order has enabled the Village Government to exercise greater control over organising numerous natural and economic resources it possesses, including how to control the village's tangible assets and financial resources (Indriasari et al., 2020).

Under this law, villages that have fulfilled requirements are eligible for a specific amount of financial resources from the central government of around one billion rupiahs (equivalent to about 71,439 US dollars) per year. The Financial Ministry of the Indonesia Republic announced that village funds provided have increased annually from IDR 20.67 trillion (2015) to IDR 70 trillion (2019) (Pratolo and Jatmiko, 2020). In addition, Arifin et al. (2020) state that it has been distributed for four years with a total of IDR268 trillion (USD19.14 billion). Therefore, there is a need for comprehensive performance measures for village administration. Even though there are previous studies on village administration performance, they employed the performance measure (Sofyani et al., 2020; Lukiastuti, Iskanto, and Djou, 2022), which directly confirmed using Confirmatory Factor Analysis (CFA) the concept of village administration performance. In addition, the performance measure should develop first by using the explanatory factor analysis.

Performance measures

Robert Kaplan and David Norton introduced the BSC in 1989. Its goal is to combine non-financial and financial measures to provide managers with more strategic information than just financial measures (Perkins et al., 2014) to benefit customers, shareholders, and citizens (Kaplan and Norton, 2004). In addition, Kaplan and Norton (2004) argue that the strategy map is grounded on the following principles: (i) strategy balances contradictory forces, (ii) value is created through internal business processes, (iii) strategy is based on a differentiated customer value proposition, (iv) strategic alignment determines the value of intangible assets, and (v) strategy consists of simultaneous, complementary themes. However, there are various opinions on the performance measure of BSC. For example, Hoque and James (2000) confirm twenty performance measures, whilst Maiga and Jacobs (2003) also used twenty performance measures of the balanced scorecard factor and provided empirical evidence of interaction activity-based costing (ABC) and BSC. However, Yeniyurt (2003) suggests twenty-two performance measures for multinational and national companies. In addition, Ellingson and Wambsganss (2001) believe that BSC measures are linked to each other and the organisation's mission, providing an interrelated management system. Based on the above argumentation, we summarise the performance measures in Table 1 to suit the requirement of our study on village administration in Indonesia.

Table 1

Performance measure

Code	Indicator	1	2	3	4	5	6	7	8	9	10
pm1	Operating effectiveness										✓
pm2	Operating efficiency						✓	✓			
pm3	Assets utilisation		✓		✓						
pm4	Autonomy ratio										✓
pm5	Operating village revenue										✓
pm6	Operating village revenue effectiveness										✓
pm7	Services quality		✓		✓			✓			
pm8	Services functionality			✓							
pm9	Services usefulness					✓					
pm10	Community satisfaction		✓		✓		✓	✓		✓	
pm11	Waiting time	✓	✓		✓						
pm12	Image and reputation	✓									
pm13	Community complaint					✓					
pm14	Service recognition						✓		✓		
pm15	Processes quality							✓	✓		
pm16	Target selected community facilitation	✓								✓	
pm17	Process's reliability	✓	✓		✓						
pm18	Community acquisition facilitation	✓					✓				
pm19	Process innovation		✓		✓		✓				
pm20	Service innovation		✓		✓						
pm21	Employee skills	✓								✓	
pm22	Employee capability in science and technology			✓							
pm23	Knowledge sharing			✓							
pm24	Vision, objective and value-sharing awareness			✓							
pm25	Capability to manage knowledge			✓							
pm26	Accessibility to various information			✓							

Sources: (Ellingson and Wambsganss, 2001; Hoque and James, 2000; Kaplan and Norton, 1992; Maiga and Jacobs, 2003; Wu and Chen, 2014; Yeniyurt, 2003; Solano et al., 2013; Gumbus and Lyons, 2002; Libby et al., 2004; Mardiasmo, 2009).

Operating effectiveness is the ability of the village administration to realise the operating revenue, and it usually uses the ratio of the realised operating revenue to the target operating (Mardiasmo, 2009). Operating village revenue consists of three components: revenue from village funds, village fund allocation, and village original revenue (Maimun et al., 2023). The Village Fund is a central governmental financial resource designated to advance village development in Indonesia. The village fund, instituted by Law No. 6 of 2014 on Villages, seeks to empower local communities, augment village governance, and increase public services. Hence, the village allocation fund is the revenue gained by the village administration from the local government. Local governments are essential in the allocation process, evaluating village bids and ensuring that money is disbursed in alignment with national and regional development priorities. Finally, the village original revenue denotes the revenue produced by villages via their own economic activity and resources, without reliance on other financing sources such as government transfers or subsidies.

Operating efficiency is the village administration's ability to use the resources (input) to gain the output, and it is measured by the operating cost ratio to operating income (Mahmudi, 2007; Mardiasmo, 2009). This measure is important for cost structure (Solano et al., 2013). The lowest ratio brings higher financial performance. In the case of rural local administration, the low operating cost can positively impact the programme implementation cost. Hence, asset utilisation is another measure of cost structure (Hoque and James, 2000; Maiga and Jacobs, 2003). It indicates the overall office asset effectiveness, which shows quality (no defect unit), performance (speed of operation), and availability (no pause in the process). The autonomy ratio is the ability of the village administration to operate autonomously, and it usually uses the proportion of the operating revenue to total revenue (Mahmudi, 2007; Mardiasmo, 2009). The higher this ratio, the higher the village administration's financial performance. Therefore, another measure identified in the literature is operating village revenue and its effectiveness. It is an important performance measure for village administration (Mahmudi, 2007; Mardiasmo, 2009). Operating village revenue is revenue from village-owned economic activity and resources, "or village original revenue" (Maimun et al., 2023). The higher the village's original revenue, the better the village administration's performance. The operating village revenue effectiveness is the ability of the village administration to realise its village's original revenue, and the ratio of the realised village original revenue and target village original revenue usually measures it.

Service quality of the village administration performance measure is suggested by (Ellingson and Wambsganss, 2001; Solano et al., 2013; Maiga, Nilsson and Jacobs, 2014). The service quality comprises several aspects, such as tangible, empathy, responsiveness, reliability and assurance (Parasuman, Zeithaml, and Berry, 1988). Tangibles denote the physical elements of service provision, encompassing the aesthetics of facilities, equipment, staff, and communication materials. These factors constitute the initial interaction between

the client and the service provider, profoundly affecting customer perceptions of quality (Bitner, 1992). Thus, empathy entails delivering compassionate, personalised attention to clients. It demonstrates the service provider's capacity to comprehend and respond to clients' distinct wants and concerns (Parasuman, Zeithaml, and Berry, 1988). In addition, responsiveness refers to the readiness of service providers to assist clients and immediately address their requests or issues. This factor highlights the significance of prompt service delivery and efficient communication (ibid.). Hence, reliability refers to a service provider's capacity to consistently and accurately deliver promised services. This dimension is frequently seen as the most crucial element of service quality, as it directly influences customer trust and expectations (ibid.). Finally, assurance includes staff's expertise, skill, and politeness and their capacity to instil trust and confidence in society. This component is especially significant in services characterised by a substantial level of risk or uncertainty (ibid.).

Thus, the functionality of the services is the ability of the village administration's service to function as the community expected (Kaplan and Norton, 2004). The efficacy of village administration services is intrinsically connected to their capacity to fulfil community expectations. By prioritising quality, responsiveness, and community participation, village administrations can improve their efficacy and cultivate confidence among citizens. Moreover, the service usefulness is the service or good the village administration provides that the community can use. The utility of services rendered by village administrations is seen in their significant influence on community welfare, economic advancement, and social togetherness. Village governments significantly enhance people's quality of life and promote sustainable development by providing needed services and goods. Ongoing investment in these services is essential to meet the changing requirements of rural communities and guarantee their sustained survival.

The next measure is community satisfaction, as suggested by many experts (Hoque and James, 2000; Yeniyurt, 2003; Libby, Salterio and Webb, 2004; Maiga, Nilsson, and Jacobs, 2014). Satisfaction is the measure of the degree of happiness or unhappiness toward the performance of the goods or services provided by an organisation (Kotler and Keller, 2009). Community satisfaction is a complex notion that includes individuals' perceptions and assessments of the services and conditions in their community. It is affected by multiple aspects, such as the quality of public services, community involvement, and the overall living environment. Studies demonstrate that community happiness can profoundly influence social cohesion, public health, and the efficacy of local governance. Waiting time is another performance measure usually used by service organisations (Ellingson & Wambsganss, 2001; Hoque & James, 2000; Maiga et al., 2014), which influences the community-village administration relationship. The next measure is the image and reputation of an organisation (Ellingson and Wambsganss, 2001). This measure is important because it makes the name of the organisation – and thus the quality of its work – known externally. In village administration, waiting time is a vital performance metric that indicates the efficiency and efficacy of service de-

livery. This statistic is especially important in rural areas where administrative capabilities and resources may be constrained, affecting the overall satisfaction of the inhabitants with their public services. Research demonstrates that waiting times can profoundly affect people's perceptions of service quality and their overall satisfaction with village administration.

Community complaints are another measure of performance that influences community satisfaction (Wu and Chen, 2014). In village administration, a "community complaint" denotes a formal articulation of discontent or worry community members express against local authorities' acts, policies, or services. This concept is essential for promoting accountability and responsiveness in village governance systems. The process for submitting complaints typically includes administrative protocols that enable residents to articulate their problems efficiently, guaranteeing prompt attention to their concerns. Service recognition is an important performance measure suggested by experts (Gumbus and Lyons, 2002; Yeniyurt, 2003). The community recognise the services provided by the village administration. In addition, service recognition is included in organisation images. Service recognition denotes the appreciation of employees' efforts in service delivery, which can profoundly impact both staff morale and customer satisfaction. Scholars in organisational behaviour and human resource management assert that acknowledging service excellence incentivises personnel and cultivates a high-performance culture and customer focus.

Based on the internal process, we have identified the relevance of six measures: process quality, target-selected community facilitation, process reliability, community acquisition facilitation, process and service innovation and knowledge management.

First, process quality refers to the ability of the village administration to have high-quality processes (Gumbus and Lyons, 2002; Yeniyurt, 2003). Process quality denotes the extent to which a process adheres to established standards and criteria, guaranteeing that the outputs are uniform, dependable, and fulfil client expectations. In a progressively competitive landscape, firms must prioritise process quality to elevate customer satisfaction, save costs, and boost overall performance. Second, community facilitates community selection or customer management processes (Kaplan and Norton, 2004). Community facilitation is essential in community management, acting as a conduit between members and the resources or information necessary to attain their objectives. Community facilitation includes diverse tactics designed to empower individuals and groups to engage in their growth actively.

The third measure is process reliability. Thus, it refers to the dependability of operation management processes in the village administration (Hoque and James, 2000; Ellingson and Wambsganss, 2001; Maiga, Nilsson and Jacobs, 2014). It includes on-time service delivery to the community and keeping appointment times. Process reliability in village administration is a complex issue dependent on a strong legal framework, efficient technology utilisation, active community engagement, and the continuous development of village officials. These components function synergistically to establish a dependable

administrative framework capable of effectively addressing the community's requirements. The fourth performance measure is community acquisition facilitation (Ellingson and Wambsganss, 2001; Yeniyurt, 2003). It refers to the administration facilitating the community acquisition in the community process. In addition, the following performance measures are also found in the literature: service innovation and process innovation (Hoque and James, 2000; Yeniyurt, 2003; Maiga, Nilsson and Jacobs, 2014).

The next performance measure is related to the employees and their abilities to improve and innovate processes and services. Six aspects are identified in the literature: employee skill, capability in science and technology, knowledge sharing, knowledge sharing awareness, ability to manage knowledge and access to various information. Employee skills and capabilities reflect the human capital in an organisation (Ellingson and Wambsganss, 2001; Libby, Salterio, and Webb, 2004; Kaplan and Norton, 2004). In village administration, the skill and capability of personnel are essential for efficient governance and service provision. Village administrators are required to have a varied skill set that improves their efficacy and fosters the general advancement of their communities.

This synthesis will examine the fundamental skills and competencies necessary for efficient village administration, substantiated by several academic references. In addition, knowledge sharing among employees and awareness of shared vision, values and objectives is considered organisation capital (Kaplan and Norton, 2004). Knowledge dissemination among employees in village administration is essential for fostering a collective vision and attaining corporate goals. By cultivating a culture of collaboration, trust, and effective communication, village administrations can improve their operational efficiency and more effectively serve their communities. In addition, the awareness of a unified vision in village administration is essential for fostering community involvement, improving public participation, and attaining collective objectives. The interaction among leadership, community engagement, and the successful articulation of a collective vision establishes a strong foundation for sustainable village government.

Finally, the capability to manage knowledge and accessibility to various information is another capital, information capital (Kaplan and Norton, 2004). The ability to handle knowledge efficiently is essential for businesses seeking to improve performance and promote innovation. Knowledge management (KM) includes many procedures and tactics that enable the generation, dissemination, and use of knowledge inside an organisation. A thorough comprehension of KM capabilities can be obtained from diverse frameworks and models. In addition, integrating digital technologies and promoting transparent government practices greatly boost the accessibility of information in village administration. These advancements enhance the efficiency of administrative operations and empower communities by equipping them with essential tools and information for active participation in governance. Semantic classification of the performance measurement identified in the literature as follows.

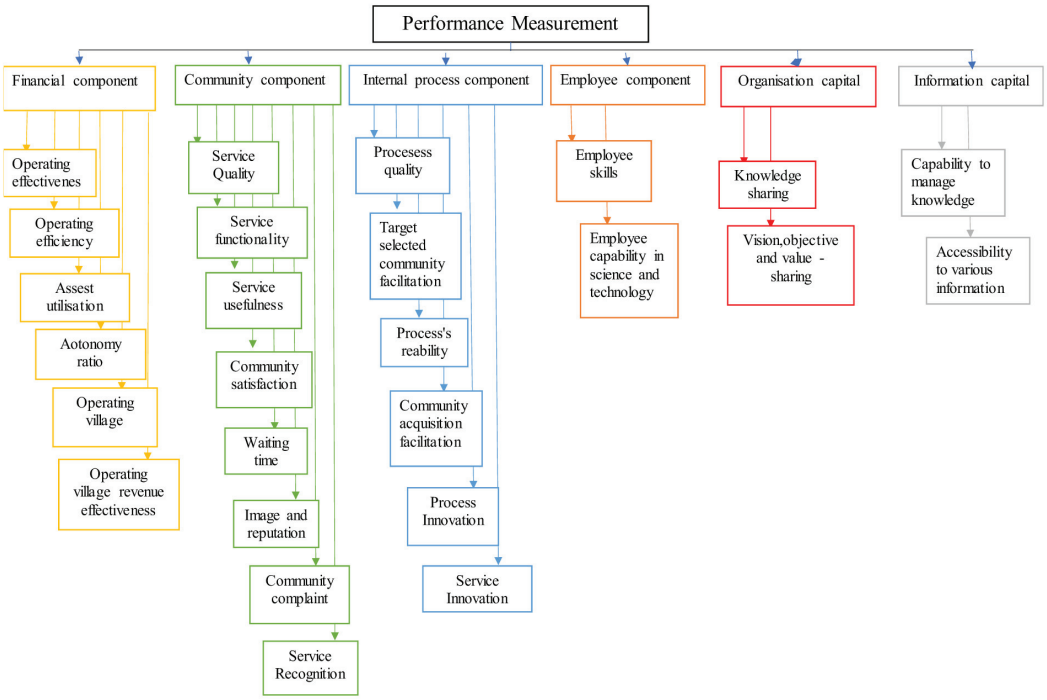

Figure 1: **Semantic classification of performance measurement**

Data and methods

Data

A sample of fifty-five village administrations in Pariaman, Indonesia, was selected by random sampling. Each government is represented by four respondents: the secretary, general and administrative affairs, finance and accounting, and planning divisions. The 26 measures identified in the literature (refer to Table 1) were formulated into questionnaire items and anchored onto a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The survey questionnaire also included questions on the demographic background of the respondents. We conducted face and content validity as well as a pilot test on five experts and 30 students, respectively. The questionnaires were delivered to the village administration office, which had one week to distribute, fill out, and collect them. The questionnaires were screened to make sure all items are completed.

Methods

The data was then analysed using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA is a popular and widely used statistical procedure in the social sciences (Costello and Osborne, 2005) that can develop composite patterns by inquiring about the dataset and testing predictions (Child, 2006). EFA is an exploratory technique used to create a theory to seek the narrower group of k latent factors to reflect the greater set of j variables (Robin and Capraro, 2006). In this study, we used SPSS software for exploratory factor analysis. Furthermore, as the questionnaire items were newly and internally developed, we used CFA

analysis for the subsequent analysis as per the recommendation of Marsh et al. (2010). For the purpose of this study, CFA is an appropriate statistical method for supporting construct validation (Thompson, 2007).

Results and discussion

Fifty-five village administrations participated in this study, and four respondents represented each village administration. After the initial screening, 219 questionnaires were deemed as usable for subsequent analyses. The respondent's profile is presented in Table 2, which shows that respondents' age is dominated by those who are 31–40 years old (42.92%), followed by 22–30 years old (32.88%), 41–50 years old (15.07%), and above 50 years old (9.13%). According to gender, female is the majority (75.80%). In addition, respondents' education level comprises 61.64% (bachelor), 28.77% (other education), 8.68% (diploma), and 0.91% (postgraduate). Regarding position and job scope, 25.11% of the respondents are performing secretarial tasks, while the rest are general affairs (25.11%), planning affairs (24.66%), and financial affairs (25.11%). Finally, the experience of respondents consists of those who are below five years (47.03%), 5–10 years (31.96%), and above ten years (21%).

Table 2

Profile of respondent

Demographic data	Category	Frequency	Per cent
Age	22- 30-year-old	72	32.88
	31–40-year-old	94	42.92
	41- 50-year-old	33	15.07
	> 50-year-old	20	9.13
Gender	male	53	24.20
	female	166	75.80
Education	diploma	19	8.68
	bachelor	135	61.64
	postgraduate	2	0.91
	others	63	28.77
Position/Job Scope	secretary	55	25.11
	general affair	55	25.11
	planning affair	54	24.67
	finance affair	55	25.11
Experience	< 5 years	103	47.03
	5–10 year	70	31.96
	> 10 years	46	21.01

Source: Created by the authors (- hereafter, unless otherwise indicated).

Exploratory factor analysis (EFA)

One of the objectives of this study is to group the indicators identified in the literature into several factors using exploratory factor analysis. The general purpose of factor analysis is to summarise data so that patterns and associations can be easily understood and interpreted (Yong and Pearce, 2013). In addition, (Yong and Pearce, 2013) adds that factor analysis is generally operated to rearrange variables into a restricted set of clusters based on shared variance and, hence, secludes construct and concept. The Kaiser-Meyer- Olkin test of sampling adequacy (KMO) and Bartlett's Test of Sphericity are commonly applied to supply more complex measures for evaluating the association strength and proposing the variables' factorability (Beavers et al., 2013). The KMO and Bartlett value of 0.78 is superior, and the degree of common Variance is classified as middling (ibid.). In addition, the significance of the Bartlet test is 0.00 (<0.05), verifying that the observed correlation matrix is statistically distinct from a singular matrix and ascertaining that linear combinations exist (Pett, Lackey, and Sullivan, 2003).

Table 3

KMO dan Barllet test for 26-item PM scale

Measure of samling adequacy		value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.78
Bartlett's Test of Sphericity	Approx. Chi-Square	2887.99
	df	276.00
	Sig.	0.00

To support the sampling adequacy test, the anti-image correlation is conducted. The diagonal elements of the Anti- Correlation matrix minimal value of 0.5 is recommended (Yong and Pearce, 2013) as reliable and distinct factors cannot be produced if this requirement is not matched. In the first attempt to produce the anti-image correlation, two performance measures, i.e. bsc16 and bsc26, have a correlation coefficient of less than 0.5. Therefore, it was deleted, and the data was reanalysed. The result of the second analysis shows that all correlation coefficients are now above 0.5. Hence, we can conclude that the anti-image correlation support that the sample of this study is adequate. The next procedure is to produce the factor extraction using principal component analysis.

The component analysis involves the total Variance in the initial extraction. The extraction method of component analysis commonly used is Principal Component Analysis (PCA) is most appropriate to lessen the quantity of items to a smaller amount of representative components (Costello and Osborne, 2005). the Kaiser Criterion is the most commonly used eigenvalue criteria, which expresses that factors should be maintained if their eigenvalues are larger than or equal to one (Costello and Osborne, 2005). The component analysis results show that the number of components or factors created is six factors due to their eigenvalue above 1 (refer to Table 4).

Alternatively, the number of factors created also can be observed from the scree plot in concurrence with the eigenvalues to specify the number of factors to maintain (Yong and Pearce, 2013). Cattell's Scree Plot is a graphical portrayal of the factors and their corresponding eigenvalues (Beavers et al., 2013). The scree test necessitates inspecting the graph of the eigenvalues and searching for the breaking point or the natural bend in the data where the curve flattens out (Costello and Osborne, 2005). In addition, Costello and Osborne (2005) argue that the number of data points above the "break" is usually the number of components or factors to maintain. However, it can be unclear if data points are clustered near the bend. Figure 2 depicts the scree plot for this data. According to the scree plot, the number of factors is consistent with Eugene's value (six factors).

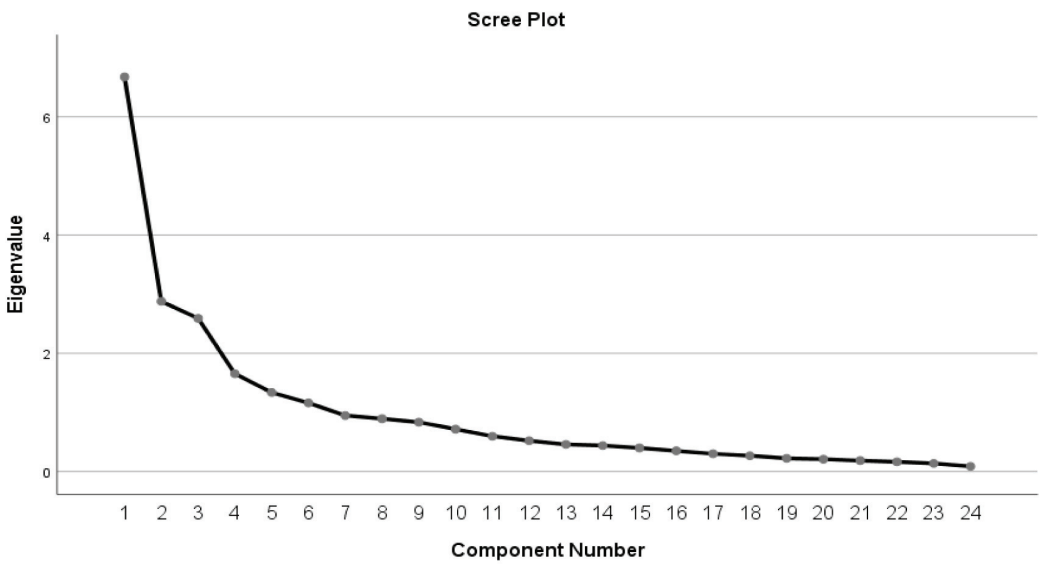

Figure 2. **Scree plot**

Extracted Factor along wiht their related variabel

The mathematical purpose of factor analysis is to compress the relationships between observed variables and the factors (Beavers et al., 2013). An infinite number of rotations describes the same number of Variances (Tabacknick and Fidell, 1996). Table 4 informs the result of the loading factor after selecting the varimax rotation due to cross-loading of the indicator into more than one factor. In this case, we chose the varimax as it was a recommended rotation technique when exploring the dataset (Yong and Pearce, 2013). In addition, Tabachnick and Fidell (2019) argue that "none of the extraction techniques routinely supply an interpretable solution without rotation.

VAPM1-Financial Performance Measure: it has three performance measures, namely autonomy ratio (pm4), operating village revenue (pm5), and operating village revenue effectiveness (pm6). They are more related to the financial indicators of the village administration.

VAPM2-Society Performance Measure: it has four performance measures, namely the service quality (pm7), service functionality (pm8), services usefulness (pm9) and community satisfaction (pm10). They are more related to the society performance of the village administration.

Tabel 4

Six factor structure obtained from calibaration sample from EFA

Code	Measure	Loading factor	Communalities	Mean
VAPM1: Financial Performance Measure				
(Eugene value=2.59, % of Variance=10.79, Cronbach alpha=0.90, Mean=3.27)				
pm4	Autonomy ratio	0.89	0.81	3.28
pm5	Operating village revenue	0.92	0.87	3.24
pm6	Operating village revenue effectiveness	0.90	0.82	3.28
VAPM2: Society Performance Measure				
(Eugene value=2.88, % of Variance=11.99, Cronbach alpha=0.87, Mean=4.19)				
pm7	Services quality	0.80	0.76	4.16
pm8	Services functionality	0.79	0.76	4.23
pm9	Services usefulness	0.77	0.77	4.21
pm10	Community satisfaction	0.57	0.48	4.17
VAPM3: Internal Process Performance Measure				
(Eugene value=1.34, % of Variance=5.56, Cronbach alpha=0.23, Mean=3.86)				
pm17	Process's reliability	0.82	0.55	4.06
pm18	Community acquisition facilitation	0.68	0.51	3.66
VAPM4: Learning and Growth Performance Measure				
(Eugene value=6.67, % of Variance=27.80, Cronbach alpha=0.92, Mean=4.03)				
pm19	Process Innovation	0.66	0.51	3.81
pm20	Service innovation	0.79	0.70	4.01
pm21	Employee skills	0.77	0.68	4.07
pm22	Employee capability in science and technology	0.79	0.76	4.10
pm23	Knowledge sharing	0.87	0.77	4.09
pm24	Vision, objective and value sharing awareness	0.84	0.73	4.03
pm25	Capability to manage knowledge	0.85	0.76	4.12

Code	Measure	Loading factor	Communalities	Mean
VAPM5: External Control Mechanism Performance Measure				
(Eugene value=1.65, % of Variance=6.89, Cronbach alpha=0.70, Mean=3.82)				
pm11	Waiting time	0.78	0.70	3.64
pm12	Image and reputation	0.83	0.76	3.86
pm14	Service Recognition	0.63	0.62	3.96
VAPM6: Internal Control Mechanism Performance Measure				
(Eugene value=1.16, % of Variance=4.53, Cronbach alpha=0.84, Mean=3.69)				
pm3	Assets utilisation	0.66	0.51	3.81
pm15	Processes quality	0.51	0.65	4.11

Notes: VAPM3-Internal Process Performance Measure: it has two performance indicators that is process reliability (pm17), and community acquisition facility (pm18). This measure is more related to the internal process of the village administration.
VAPM4-Learning and Growth Performance Measure: it has seven performance measures which are the process innovation (pm19), services innovation (pm20), employee skill (pm21), employee capability in science and technology (pm22), knowledge sharing (pm23), vision objective, and value sharing awareness (pm24), and capability to manage knowledge (pm25). This measure is more related to the learning and growth of the village administration.
VAPM5-external control mechanism performance measure: it has three performance measures that are the waiting time (pm11), image and reputation (pm12), and service recognition (pm14). This measure is more related to the external control mechanism of the village administration.
VAPM6-internal control mechanism performance measure: it has two performance measures which are asset utilization (pm3), and process quality (pm15). This measure is related to the internal control mechanism of the village administration.

Validation of the Derived Factor Structure

Convergent and discriminant validity

Studies using CFA build upon modest theoretical factors. Deficiency of testing option theoretical views, or insufficient documentation may not present adequate proponents for construct validity (Distefano and Hess, 2014). In this case, we used SEM-PLS for analysis to confirm the factors identified in the EFA. We used two construct validations: discriminant and convergent validity (Hair et al., 2017). Table 7 presents the convergent validity using four statistical techniques: average variance extracted (AVE), composite reliability, Cronbach alpha, and outer loading.

Outer loading is a validation of an indicator, and its values should be above 0.70 (Hulland, 1999). Cronbach alpha and composite reliability is a construct or latent variable reliability, and its cut-off should be above 0.70 (Bagozzi and Yi, 1988). In addition, the average Variance extracted should be above 0.50 (Henseler, 2010). As shown in Table 5, all requirements are satisfied, and convergent validity is achieved. During this process, one factor was not valid (VAPM1) to all performance measure‘s outer loading below 0.700 and it therefore appears in table below. In addition, one measure for VAPM4 (pm19) was deleted due to its outer loading below 0.70.

Table 5

Convergent validity

Value administration PM	Indicator	Outer loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
VAPM5	pm14	1.00	1.00	1.00	1.00
VAPM6	pm15	1.00	1.00	1.00	1.00
VAPM4	pm20	0.78	0.89	0.92	0.65
	pm21	0.81			
	pm22	0.80			
	pm23	0.83			
	pm24	0.82			
	pm25	0.81			
VAPM2	pm7	0.88	0.86	0.91	0.71
	pm8	0.91			
	pm9	0.84			
	pm10	0.73			

See notes to Table 4.

The second validation is discriminant validity. Discriminant validity evaluation has become a prerequisite for examining the association among latent variables (Henseler, Ringle and Sarstedt, 2015). In this case, we used the Fornell-Lacker criterion (Fornell and Larcker, 1981). In addition, Fornell and Larcker (1981) note that discriminant validity is conducted if the latent variable accounts for more variance in its associated indicator variables than it shares with other constructs in the same model. For variance-based structural equation modellings, such as partial least squares, the Fornell- Larcker criterion and cross-loading examination are the dominant approaches for discriminant validity (Henseler, Ringle and Sarstedt, 2015). As shown in Table 6, all construct (factors) have a higher square root of their AVE (boldface values), indicating that discriminant validity is achieved.

Table 6

Discriminant validity: Fornell-Lacker criterion

Performance measure	VAPM2	VAPM4	VAPM5	VAPM6
VAPM2	**0.84**			
VAPM4	0.64	**0.81**		
VAPM5	0.48	0.35	**1.00**	
VAPM6	0.59	0.69	0.34	**1.00**

See notes to Table 4.

Another prevalent technique for discriminant validity is the evaluation of cross-loadings or item-level discriminant validity (Henseler, Ringle, and Sarstedt, 2015). This procedure is also related to the EFA, where researchers routinely investigate indicator loading patterns to recognise indicators that possess high loadings on the same factor and those that load extremely on multiple factors (Mulaik, 2009). In the case of PLS, Chin (1998) argues that each measure (observed variables) loading should be greater than all of its cross-loadings. Table 7 shows the result of cross-loading for all construct (factor). All measures belong to its construct due to their higher loading than others.

Table 7

Discriminant validity: cross-loading

Performance measure	VAPM2	VAPM4	VAPM5	VAPM6
pm14	0.48	0.35	**1.00**	0.34
pm15	0.59	0.69	0.41	**1.00**
pm20	0.50	**0.78**	0.22	0.54
pm21	0.53	**0.81**	0.28	0.60
pm22	0.57	**0.80**	0.32	0.56
pm23	0.48	**0.83**	0.34	0.49
pm24	0.50	**0.82**	0.27	0.58
pm25	0.51	**0.81**	0.27	0.56
pm7	**0.88**	0.59	0.45	0.51
pm8	**0.91**	0.59	0.49	0.57
pm9	**0.84**	0.52	0.50	0.51
pm10	**0.73**	0.44	0.30	0.37

See notes to Table 4.

Figure 3 depicts the validation of performance measure using CFA. There are four valid performance measures: Learning and growth, society, internal monitoring mechanism, and external monitoring mechanism. However, fourth, the financial factor was dismissed due to low outer loading and construct reliability. The power predictions of the performance factors are adequate. The highest predictive power is the learning and growth performance measure (0.867) and can be classified as substantial (Hair et al., 2014). In addition, the lowest predictive power is the external control mechanism with R square 0.198, categorised as weak (Hair et al., 2014).

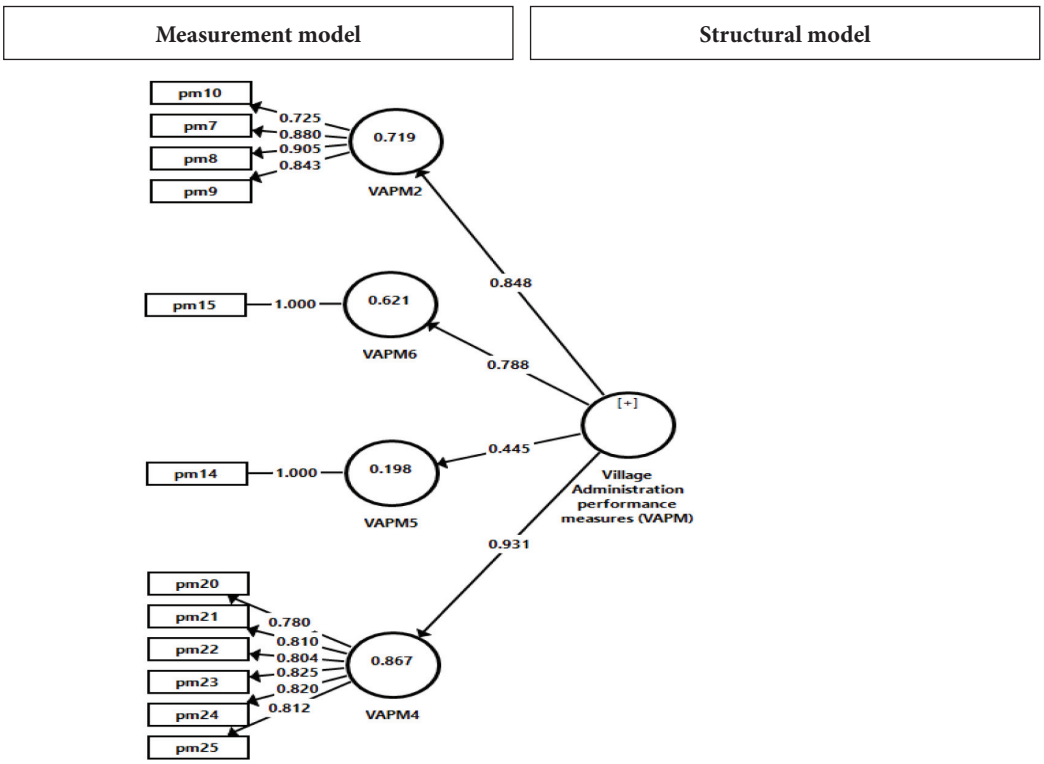

Figure 3. **Validation of performance measures using CFA.**

The descriptive statistics of the performance measures for village administration must be examined. The highest performance measure of village administrations in Pariaman city is the society or community factor. The importance of this factor is expected as it relates to the customer needs in a business institution. The lowest performance factor is the external monitoring mechanism factor (group mean 3.963) and the highest is society performance measure (4.190). A detail of the mean for each performance measure and their rank in every performance factor is evident in Table 8. The overall performance factor based on a five-point Likert scale is 4.083 and can be categorised as high performance.

Table 8

Descriptive statistic of Final Performance Measures

Code	Measure	Mean	Group mean
Society Performance Measure (VAPM2)			
pm7	Services quality	4.16	4.19
pm8	Services functionality	4.23	
pm9	Services usefulness	4.21	
pm10	Community satisfaction	4.17	

Code	Measure	Mean	Group mean
Learning and Growth Performance Measure (VAPM4)			
pm20	Service innovation	4.01	4.07
pm21	Employee skills	4.07	
pm22	Employee capability in science and technology	4.10	
pm23	Knowledge sharing	4.09	
pm24	Vision, objective and value sharing awareness	4.03	
pm25	Capability to manage knowledge	4.12	
External Control Mechanism Performance Measure (VAPM5)			
pm14	Service recognition	3.96	3.96
Internal Control Mechanism Performance Measure (VAPM6)			
pm15	Processes quality	4.11	4.11

See Notes to Table 4.

Conclusion and recommendations

The performance measure using a balanced scorecard has been developed for various organisations. However, very few studies investigated the implementation performance measure of a balanced scorecard in public sector organiations, particularly within the Indonesian context. In fact, there is no study developing the performance measure using a balanced score for village administration. This study extends other performance measurement research by creating a balanced scorecard performance measurement unique for village administration. We used exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) to validate the model. Based on the study's results, four performance dimensions of village administration are proposed: society, learning and growth, internal monitoring mechanism, and external monitoring mechanism. We finalised four performance measures from society's dimension. Hence, learning and growth factors have six measures. Internal monitoring mechanism and external monitoring mechanisms have one performance measure, respectively. Practically, this finding contributes to the village administration so that this performance measure can be implemented. Theoretically, this result generates an additional performance measure dimension not found in the previous literature: the external monitoring mechanism factor.

This study has several limitations and provides an avenue for future investigation. First, this study uses a limited sample and village administration in one city. Therefore, the subsequent investigation can add more samples and widen the number of villages by combining villages of several towns or regencies to have more robust results. Finally, this study employs a limited number of per-

formance measures, and future research can add more performance measures to be explored by conducting a more comprehensive literature review. We would like to propose other scholars conduct additional tests, such as the Wilcoxon signed-rank test, to confirm the high level of performance for the indicators used in this study, as well as Spearman Ranked correlation. Finally, qualitative research could be conducted to understand the performance of village administration better. What intrinsic and extrinsic factors influence performance could be better understood accordingly.

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