

Analysis of the Service System to Raise Awareness of Mandatory Inspection and Re-Inspection at the Malang City Legal Metrology Unit

Fifi Irmawati*, Prima Vitasari, Renny Septiari

Institut Teknologi Nasional Malang, Indonesia

Email: fifirmawati@gmail.com*

Abstract

Keywords

Service System, Service Quality, Mandatory Verification Awareness, Legal Metrology, SERVQUAL.

This research analyses how the service system influences mandatory verification awareness at Malang City's Legal Metrology Unit. Despite the elimination of service fees in 2024, fluctuations in compliance (2021–2024) indicate that cost alone does not drive participation; service system aspects play a significant role. This research employs a quantitative approach using a survey method. The population consists of 1,324 traders who had not conducted verification or re-verification in four traditional markets in Malang City. A total of 307 respondents were selected using proportional stratified random sampling. The independent variables include accessibility, availability, service quality, efficiency, and effectiveness, while the dependent variable is mandatory verification awareness. Data were collected through questionnaires, interviews, observations, and documentation. Data analysis techniques included validity and reliability testing, descriptive analysis, partial t-tests, and simultaneous F-tests. The results indicate that all research instruments are valid and reliable. Descriptively, accessibility is categorised as good (mean = 3.824), availability as moderately good (mean = 3.188), and service quality as moderate (mean = 3.015). These findings suggest that improvements are particularly needed in the dimensions of accessibility, availability, service quality, efficiency, and effectiveness. Simultaneously, the service system has a significant effect on mandatory verification awareness. Therefore, enhancing the service system through improved information access, optimisation of human resources, strengthening of staff competence, and increased service efficiency and effectiveness can serve as strategic measures to raise mandatory verification awareness and achieve measurement orderliness in Malang City.

INTRODUCTION

Malang City, with an area of 110.06 km², consists of 5 sub-districts and 57 villages (Malang City in Figures, 2014), with mandatory distribution in each sub-district (Fuller, 2018). In 2017, the Legal Metrology Unit (Unit Pelaksana Teknis/UPT) of Malang City was established based on the mandate of Law Number 23 of 2014 concerning Regional Government. Previously, the implementation of verification and re-verification services was the authority of the Central and Provincial Governments; however, on 1 January 2017, this authority was delegated to the City/Regency Government. The Legal Metrology UPT of Malang City, which operates under the Office of Cooperatives, Industry and Trade of Malang City, has the authority to provide marking and re-marking services for measuring instruments,

measures, weighing instruments, and related equipment (Ukur, Takar, Timbang, dan Perlengkapannya/UTTP).

Based on the Regulation of the Minister of Trade of the Republic of Indonesia Number 24 of 2024 concerning Stamping and Re-marking Activities of Measuring Instruments, Measures, Weighing Instruments, and Legal Metrology Equipment (Kementerian Perdagangan Republik Indonesia, 2024), the implementation of stamping and re-marking involves affixing a valid stamp or a valid void stamp, or providing written information accompanied by a valid stamp or valid void stamp, carried out by authorised officers based on tests conducted on measuring instruments, measures, weighing instruments, and related equipment. The implementation of stamping and re-marking is intended to ensure that such instruments do not exceed the Permissible Error Limit (*Batas Kesalahan yang Diizinkan/BKD*) (Ficco et al., 2023; Pendrill, 2014). Verification and re-verification refer to the process of comparing measuring instruments, measures, weighing instruments, and equipment owned by the public against the standards held by the Legal Metrology UPT of Malang City (Rodrigues Filho & Gonçalves, 2015; Juliani & Nawangpalupi, 2020). As a government institution providing public services related to verification and re-verification, the Legal Metrology UPT of Malang City continually strives to improve its service system (Juliani & Nawangpalupi, 2020; Danilov et al., 2024) as part of its efforts to realise measurement orderliness (Rodrigues Filho & Gonçalves, 2015; Zainudin et al., 2021).

In the world of trade, the use of measuring instruments, weighing instruments, and related equipment is of great importance, as they are used in buying and selling transactions between goods owners and consumers, and also serve to improve the quality of products to be marketed (Sandela et al., 2022; Rodrigues Filho & Gonçalves, 2015). Owners of UTTP equipment — referred to as *wajib tera* (mandatory verification parties) — who fail to carry out verification and re-verification will contribute to the use of inaccurate and non-compliant measuring instruments within the Malang City area (Alfarisa, 2021; Sihombing & Resen, 2024). In buying and selling transactions, this is detrimental to consumers (Rodrigues Filho & Gonçalves, 2015; Sandela et al., 2022) and constitutes a violation of Law Number 2 of 1981 concerning Legal Metrology, specifically Chapter VIII on Criminal Provisions (Undang-Undang Republik Indonesia, 1981; Sihombing & Resen, 2024; Putra & Heriyanto, 2022).

Consumer protection is a certainty that must be guaranteed as a consumer's right in conducting transactions involving products and services. It serves as a legal instrument to protect and fulfil consumer rights. The use of measuring instruments, measures, weighing instruments, and equipment must be supported by marking and re-marking services, with the aim of ensuring the accuracy and certainty of measurement.

Several previous studies have examined aspects of legal metrology services across various regions. Research conducted at the Legal Metrology UPTD of Metro City identified uneven re-marking services across the region and service bottlenecks as the main obstacles (Lestari & Fitriani, 2021). Another study on the quality of metrological services in DKI Jakarta found that public perception of service quality still requires improvement (Rahmawati et al., 2019). Research at the Legal Metrology Unit of Banyuwangi Regency found that user experience, ease of service, and service convenience had a significant effect on interest in repeat visits, with user satisfaction as an intervening variable (Harianto, 2021). In addition, research in Purwakarta Regency measured the quality of public services using the SERVQUAL

approach, which emphasises the importance of the tangible, reliability, responsiveness, assurance, and empathy dimensions (Ferdinand & Mahrudi, 2022).

At the conceptual level, international studies affirm that legal metrology should be positioned as a public legal instrument with binding legal force, supported by judicial oversight (Fisher, 2019). That study found that strengthening legal certainty is essential to enhancing supervision and guidance in legal metrology governance in Indonesia (Fisher, 2019). Furthermore, a structural and normative analysis of Indonesia's legal metrology system identified regulatory inconsistencies, procedural ambiguities, and institutional disconnections between national and regional metrology units (Santoso & Widodo, 2020). These conditions have led to institutional stagnation, limited public awareness, and systemic regulatory vulnerability (Santoso & Widodo, 2020).

Although various studies have examined aspects of legal metrology service quality, a significant gap remains. First, most previous research focused primarily on measuring customer satisfaction or service quality in general, rather than specifically examining the influence of service systems on mandatory verification awareness. In fact, awareness among mandatory verification parties is a key factor in encouraging public compliance, given that many business actors have yet to carry out re-verification on a regular basis. Second, previous research has not simultaneously tested the five dimensions of the service system — accessibility, availability, quality, efficiency, and effectiveness — in relation to mandatory verification awareness. Third, there remains a lack of research that specifically analyses the phenomenon of fluctuations in mandatory compliance even after the elimination of service levies in 2024, which indicates that cost is not the sole determinant of compliance.

The novelty of this research lies in several aspects. First, this study integrates the five dimensions of the service system — accessibility, availability, quality, efficiency, and effectiveness — into a single analytical model to examine their influence on mandatory verification awareness, which has not been widely undertaken in the context of legal metrology in Indonesia. Second, this study examines mandatory compliance patterns following the elimination of service levies in 2024, thereby offering a new perspective that non-cost factors, particularly the service system, play a more significant role. Third, this study employs a quantitative approach with proportional stratified random sampling across four traditional markets in Malang City, which allows for greater generalisation of results compared to previous single-case studies. Fourth, this study uses fishbone diagrams to identify the root causes of low mandatory verification awareness, resulting in more comprehensive and measurable improvement recommendations.

Based on the background and problems described above, this study aims to analyse the influence of the service system — comprising accessibility, availability, quality, efficiency, and effectiveness — on increasing awareness of mandatory verification and re-verification in conducting UTTP stamping at the Legal Metrology UPT of Malang City, both partially and simultaneously. This research is expected to provide both theoretical and practical benefits. Theoretically, the findings can enrich the body of knowledge in the fields of public service management and legal metrology, particularly regarding the factors that affect mandatory verification awareness. This research may also serve as a reference for the development of service system models oriented towards increasing community compliance. Practically, this research is useful for the Legal Metrology UPT of Malang City as evaluative material and input

for developing strategies to improve the service system. For local governments, the findings can serve as a policy basis for resource allocation and the development of verification and re-verification service programmes. For the public, this research is expected to increase understanding of the importance of UTTP stamping and re-stamping and to encourage awareness of and compliance with legal metrology provisions. For future researchers, this study can serve as a reference for developing further research involving different variables or locations.

METHOD

Types of Research

This type of research is quantitative research, according to Marinu Waruwu et al., (2025)) Quantitative research methods play an important role in scientific research, especially in producing objective and measurable data, this method is widely used to answer research questions that require numerical and statistical analysis.

The quantitative approach then in Kittur's opinion (2023) in Marinu Waruwu et al., (2025)), quantitative research is a systematic investigation that collects measurable data to perform mathematical and statistical analysis, which fundamentally measures aspects such as attitudes, beliefs, and behaviors to draw conclusions. Next is Haradhan. Marojahan (2020) in Marinu Waruwu et al., (2025)) defines quantitative research as a methodology used to measure attitudes, opinions, behaviors, and certain other variables, generating numerical data to generalize the results of the sample population that larger.

Research Object

According to Supriyati (2012) in - Dwy Dawn (2024) which means that the object of research talks about what and who will be the target of the research. Of course, in carrying out research, it should not be careless in data collection. Even the issue of when and the purpose of the research place must also be carefully considered.

This research was carried out on Mandatory Tera and Re-Tera who do not carry out tera and re-tera in the Malang City area. This research will focus on the level of awareness of the Mandatory Tera and Re-Tera by analyzing the service system that has been provided by the UPT. Legal Metrology of Malang City.

Population and Sample

The population of all must be stamped and re-stamped who have not done stamping and re-marking at the Malang City people's market is 2,580 market traders. The sampling technique from the population uses the "Statified Sampling" method, which is a sample determination technique with certain considerations (Sugiyo, 2009) in (Rosiyanti & Muthmainnah, 2020). The requirements used as samples in this research are mandatory stamps that have not carried out stamps and re-stamps of measuring instruments, measures, weighings and equipment in the people's market with a sample of four people's markets.

According to Margono (2004) in Nidia Suriani (2023), simple random sampling is a sampling technique that is carried out randomly, where each member of the population has an equal opportunity to be selected as a sample. This technique is one of the simplest and easiest sampling techniques to do, but it is still able to produce representative samples if done correctly.

For the purpose of estimating population parameters (flats, standard deviations, variances) with greater precision is to divide the population into several groups. Each group became more homogeneous than the entire population and sampled with a predetermined size for each group. The groups in this divided population are referred to as strata and sampling from each strata (level) is referred to as a tiered/tiered/layered sampling technique (Sampath, 2001) in Ari Setiawan (2021). The principle is to divide the population into groups (starata), where each strata is made as homogeneous as possible (Thompson (2002) in Ari Setiawan (2021). In sampling using the layered technique, samples are taken freely from different strata and it is not important to use the same sample design across all strata. Depending on the nature of the strata, different sampling designs can be used in different strata, for example in the absence of appropriate size information, random sampling can be used in multiple strata, while probability with a comparable (proportional) sample size can be used in the remaining strata when the measured information is available on the strata.

With an error rate of 5%, the number of samples that can be taken from 4 people's markets in Malang City, namely Big Market, Blimbing Market, Tawangmangu Market and Madyopuro Market.

RESULTS AND DISCUSSION

Factors Causing Lack of Awareness of Mandatory Stamping and Re-Stamping

In this section, the factors that are considered to affect the awareness of mandatory impressions are tested. Some of the factors tested included accessibility, availability, quality, efficiency, and effectiveness. The test was carried out using multiple linear regression tests to determine the effect simultaneously and partially.

Table 1. Multiple Linear Regression Results

Variabel	B	t	Say.	Ket.
Konstanta	27.560	15.270	0.000	Signifikan
Accessibility (X1)	0.578	5.106	0.000	Signifikan
Availability (X2)	0.047	0.287	0.775	Signifikan
Quality (X3)	0.425	2.232	0.026	Signifikan
Efficiency (X4)	0.993	5.874	0.000	Signifikan
Effectiveness (X5)	0.670	3.479	0.001	Signifikan

Source: SPSS data processing results, 2026

The results of multiple linear regression equations between the variables of accessibility (X1), availability (X2), quality (X3), efficiency (X4), and effectiveness (X5) on mandatory awareness of the mark (Y) are presented as follows:

$$Y = 27.560 + 0.578 X1 + 0.047 X2 + 0.425 X3 + 0.993 X4 + 0.670 X5 + e$$

From these equations, it can be described as follows:

- a. The value of constant (a) of 27.560 indicates that without the influence of accessibility (X1), availability (X2), quality (X3), efficiency (X4), and effectiveness (X5), it can be predicted that the value of mandatory awareness (Y) is 27.560.

- b. The effect of accessibility (X1) on mandatory tera awareness (Y) was obtained with a regression coefficient of 0.578 so that the coefficient was worth more than zero. These results show a significant positive influence, meaning that the better accessibility (X1) will have a significant effect on the better the awareness of mandatory tera (Y). The influence of accessibility (X1) on the awareness of mandatory stamps (Y) is 14.4 percent.
- c. The effect of availability (X2) on mandatory tera awareness (Y) was obtained with a regression coefficient of 0.047 so that the coefficient was more than zero. These results show a significant positive influence, meaning that the better the availability (X2) will have a significant effect on the better the awareness of mandatory stamps (Y). The magnitude of the influence produced by availability (X2) on the awareness of mandatory tera (Y) is 1.3 percent.
- d. The effect of quality (X3) on the mandatory awareness of the mark (Y) was obtained with a regression coefficient of 0.425 so that the coefficient was more than zero. These results show a significant positive influence, meaning that the better the quality (X3) will have a significant effect on the better the awareness of mandatory tera (Y). The influence produced by quality (X3) on the awareness of mandatory tera (Y) is 12.6 percent.
- e. The effect of efficiency (X4) on the mandatory awareness of tera (Y) was obtained with a regression coefficient of 0.993 so that the coefficient was worth more than zero. These results show a significant positive influence, meaning that the better the efficiency (X4) will have a significant effect on the better the awareness of mandatory tera (Y). The effect of efficiency (X4) on the awareness of mandatory tera (Y) is 27.9 percent.
- f. The effect of effectiveness (X5) on the awareness of mandatory tera (Y) was obtained with a regression coefficient of 0.670 so that the coefficient was worth more than zero. These results show a significant positive influence, meaning that the better the effectiveness (X5) will have a significant effect on the better the awareness of mandatory tera (Y). The effect of effectiveness (X5) on the awareness of mandatory impressions (Y) was 19.4 percent.

Furthermore, significance testing was carried out to test whether there was an influence between the variables of accessibility (X1), availability (X2), quality (X3), efficiency (X4), and effectiveness (X5) on the variables bound by mandatory tera awareness (Y). Significance testing was described using simultaneous tests (F test), determination coefficients (R²), and partial tests (t tests).

Hypothesis Test Results

The F test or simultaneous test explains whether there is an influence between independent variables on jointly bound variables (simultaneous). The following are presented the results of simultaneous influence testing using the F test.

Table 2. Simultaneous Test Results

Bound variables	F	Sig.	Ket.
Mandatory Awareness Tera (Y)	186.427	0.000	Signifikan

Source: SPSS data processing results, 2026

The results of the simultaneous test with the F test obtained an F value of 186.427 with a significance value of 0.000. For comparison, the F value of the table at the free degree of 3

and 301 at the alpha 5 percent was obtained of 2.244. The results show that the value of F is calculated more than the value of the F of the table ($F_{\text{hitung}} > F_{\text{tabel}}$) and the significance value is less than 0.05 ($\text{sig} < 0.05$) so that it can be stated that there is a significant influence between accessibility (X1), availability (X2), quality (X3), efficiency (X4), and effectiveness (X5) on the awareness of mandatory tera (Y) simultaneously. From the analysis, the results of the calculation of the criteria for the adoption of the decision are as follows:

1. $F_{\text{hitung}} > F_{\text{tabel}}$, then H_0 is rejected and H_a is accepted
2. $F_{\text{hitung}} < F_{\text{tabel}}$, then H_0 is accepted and H_a is rejected

Coefficient of Determination (R²)

The coefficient of determination describes how much the ability of the free variable to explain the variation of the bound variable. The value of the determination coefficient that is larger or closer to one indicates the greater the ability of the free variable to explain the variation of the bound variable. The following is presented the results of the determination coefficient using R².

Table 3. Determination Coefficient Results

Bound variables	R Square
Mandatory Awareness Tera (Y)	0.756

Source: SPSS data processing results, 2026

The result of the determination coefficient was obtained with an R Square value of 0.756, meaning that the magnitude of the influence on the mandatory awareness variable (Y) explained by the variables of accessibility (X1), availability (X2), quality (X3), efficiency (X4), and effectiveness (X5) was 75.6 percent based on table 4.19, while the remaining 24.4 percent was determined by other factors.

Partial Test (t-test)

The t-test or simultaneous test explains whether there is an influence between the independent variables on the individually (partial) bound variables. The following are presented the results of partial effect testing using the t-test.

Table 4. Partial Test Results

Variabel	t	Sig.	Ket.
Konstanta	15.270	0.000	Signifikan
Accessibility (X1)	5.106	0.000	Signifikan
Availability (X2)	0.287	0.775	Insignifikan
Quality (X3)	2.232	0.026	Signifikan
Efficiency (X4)	5.874	0.000	Signifikan
Effectiveness (X5)	3.479	0.001	Signifikan

Source: SPSS data processing results, 2026

The results of the partial test are described as follows.

- a. The accessibility variable (X1) to the mandatory tera awareness variable (Y) was obtained with a calculated t-value of 5.106 with a significance value of 0.000. For comparison, the t-value of the table at the free degree of 301 and alpha 5 percent

was obtained of 1.968. The results show that the t-value is calculated to be more than the t-value of the table ($t_{hit} > t_{table}$) and the significance value is less than 0.05 ($sig < 0.05$) so that it is stated that there is a significant influence between accessibility (X1) on the awareness of mandatory tera (Y) partially or in other words H_0 is rejected H_a is accepted, meaning that the level of awareness of mandatory tera is influenced by the ease of access provided by the UPT. Legal Metrology. Ease of access such as providing services at locations where there are many mandatory tags so that it makes it easier to bring measuring instruments to the service location.

- b. The availability variable (X2) to the mandatory tera awareness variable (Y) obtained a calculated t-value of 0.287 with a significance value of 0.775. For comparison, the t-value of the table at the free degree of 301 and alpha 5 percent was obtained of 1.968. The results showed that the calculated t-value was less than the t-value of the table ($t_{hit} < t_{table}$) and the significance value was more than 0.05 ($sig > 0.05$) so that it was stated that there was no significant influence between the availability (X2) on the mandatory awareness of the (Y) in part. The availability variable has no effect on the level of mandatory awareness because the availability of officers and budget is not a determining factor so that there are other factors that have more influence on the level of mandatory awareness of the obligatory statement.
- c. The quality variable (X3) is the variable of mandatory tera awareness (Y) where the t-value is calculated as 2.232 with a significance value of 0.026. For comparison, the t-value of the table at the free degree of 301 and alpha 5 percent was obtained of 1.968. The results show that the value of t is calculated more than the value of the table t ($t_{hit} > t_{table}$) and the significance value is less than 0.05 ($sig < 0.05$) so that it is stated that there is a significant influence between the quality (X3) on the awareness of the mandatory mark (Y) partially or in other words H_0 is rejected H_a is accepted, where if the quality of the service provided by the UPT. Legal Metrology is related to competent human resources, so it affects the increase of mandatory awareness of the word.
- d. The partial test between the efficiency variable (X4) and the mandatory awareness variable (Y) obtained a calculated t value of 5.874 with a significance value of 0.000. For comparison, the t-value of the table at the free degree of 301 and alpha 5 percent was obtained of 1.968. The results show that the t-value is calculated more than the t-value of the table ($t_{hit} > t_{table}$) and the significance value is less than 0.05 ($sig < 0.05$) so that it is stated that there is a significant influence between efficiency (X4) on the awareness of mandatory tera (Y) partially or in other words H_0 rejected H_a is accepted. Service efficiency such as the availability of a large number of services and the existence of a complaint number will make it easier for the mandatory tera to communicate, thus the awareness of the mandatory tera to do the tera and re-tag can increase.
- e. The partial test between the effectiveness variable (X5) and the mandatory awareness variable (Y) obtained a calculated t-value of 3.479 with a significance value of 0.001. For comparison, the t-value of the table at the free degree of 301

and alpha 5 percent was obtained of 1.968. The results showed that the t-value was calculated more than the t-value of the table ($t_{hit} > t_{table}$) and the significance value was less than 0.05 ($sig < 0.05$) so that it was stated that there was a significant influence between the effectiveness (X5) on the awareness of the obligatory mark (Y) partially or in other words H_0 rejected H_a in acceptance. With the government's attention to mandatory tera will be able to foster a sense of pride so that the tera feels that the implementation of tera and tera ulang is very important to be implemented and awareness of the mandatory tera increases.

Based on the results of the partial test, it is known that accessibility (X1), quality (X3), efficiency (X4), and effectiveness (X5) have a significant effect on mandatory awareness of the (Y) part, while availability (X2) has no significant effect. To increase awareness of mandatory tera in the Malang City Area, several improvements must be made. The quality of the service system and re-marking needs to be carried out comprehensively which includes service access, service availability, service quality, service efficiency and service effectiveness. Based on the results of data processing, it is clear that service system variables have a significant effect on increasing awareness of mandatory and re-marking.

To find out the causative factors of the lack of awareness of mandatory marking and re-marking in carrying out the marking and re-marking of measuring instruments, measures, weighs and equipment, use the Ishikawa diagram or Fishbone Diagram which will help identify the root cause and the action to be taken. Fishbone Diagram was chosen because it is very relevant in integrating indicators in public services and provides a systematic understanding in grouping the causes of the lack of awareness of mandatory marking and re-marking so that it is more objective in analyzing to produce traceable thought flows. According to Feri (2024) overall, the Fishbone Diagram is a useful and flexible tool, both for root cause analysis and strategy planning, and can be applied in various sectors. An in-depth understanding of the use and customization of Fishbone Diagrams can help organizations and individuals achieve more accurate analysis results and more targeted solutions, thus making a significant contribution to the achievement of business and project objectives.

The causes of the lack of awareness of mandatory marking and re-marking based on the results of the survey and the results of data processing using the SPSS program can be identified as in the Fishbone Diagram below:

Table 5. Fishbone Diagram Component Data

Components	Sub components	Causal Factors	Data Source
Accessibility	<ul style="list-style-type: none"> • Limited number of services • It takes a long time to get to the service point • Remote access from location • Difficulty carrying UTTP tools • Lack of mobile services 	<ul style="list-style-type: none"> • A service that is difficult to find by the obligatory. • Taking time to get to the service location • The business location must be marked and re-marked far from the service location • Heavy measuring instruments make it difficult to carry them 	FGD Results Interview results with mandatory tera

		<ul style="list-style-type: none"> to distant service places • There is no service that is close to the location where the mandatory tagging and re-tagging are located 	
Quality	<ul style="list-style-type: none"> • Lack of information media for mandatory registration • Illegal use of measuring instruments • Mandatory incomprehension of the tera 	<ul style="list-style-type: none"> • Lack of education and difficult communication to officers • There are many illegal measuring instruments in the market and the lack of knowledge of mandatory marking and remarking about metrology 	Interview results with mandatory tera
Efficiency	<ul style="list-style-type: none"> • Limited service time • If there is a discrepancy in the measuring device, it is difficult to confirm with the officer • There is no call center at the time of service in the market 	<ul style="list-style-type: none"> • The service time has not been adjusted to the amount of potential in the market • There will be no more communication between the mandatory and re-marking and the officer after the completion of the service • Must be marked and re-marked if there is a discrepancy with the measuring instrument that has been marked 	FGD Results Interview results with mandatory tera
Effectiveness	<ul style="list-style-type: none"> • The government's lack of attention to mandatory registration • Services are considered unimportant by the obligatory • There is a need for socialization to consumers as beneficiaries 	<ul style="list-style-type: none"> • Lack of communication and interaction between the government and mandatory re-marking and re-marking 	FGD Results
Regulatory Environment	<ul style="list-style-type: none"> • There is no strict sanction given to the mandatory mark • Lack of Oversight • Frequently changing rules • Confusion must be found in obtaining services 	<ul style="list-style-type: none"> • Environmental conditions that are not conducive to sanctions • Lack of socialization to mandatory and re-stamping related to the renewal of Government Regulations 	FDG Results

Source: Results of Focus Group Discussion (FGD) and interviews with mandatory verification subjects, 2026

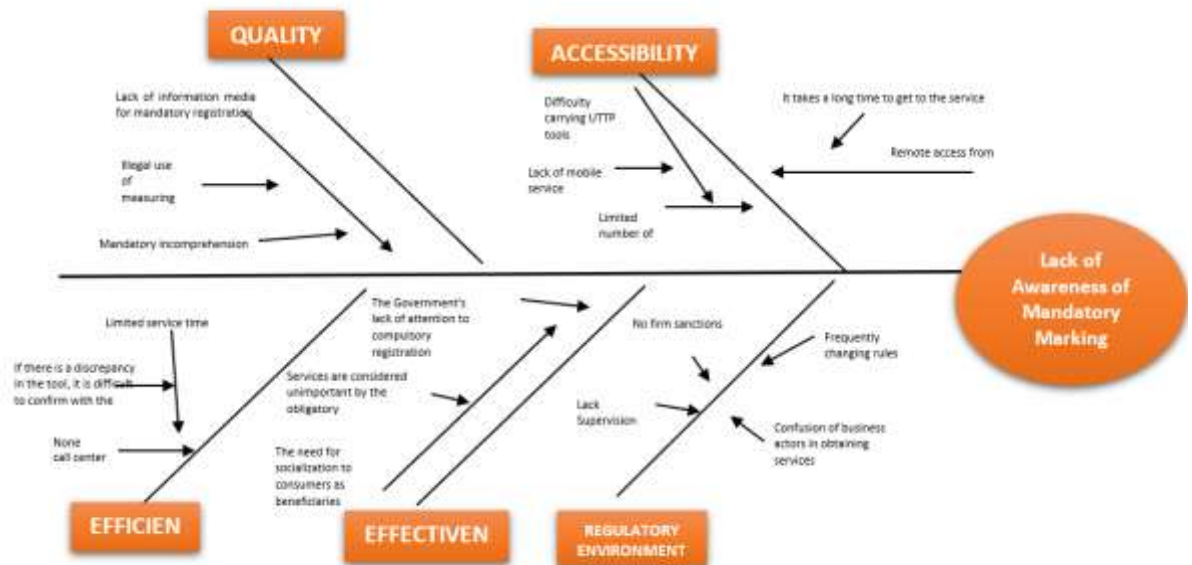


Figure 1. Fishbone Diagram

Source: Results of data analysis, 2026

Based on figure 1, it is known that the cause of the lack of awareness of the mandatory marking and re-marking of the tool, measuring measurement, weighing and equipment is the limited access to services resulting in difficulties for the mandatory marking and re-marking of measuring instruments, measures, weighs and equipment. Based on the results of interviews conducted with the mandatory tera and based on the results of the Forum Group Discussion attended by the Head of Trade, Head of UPT. Legal Metrology, 5 market coordinators, 2 surveyors, 2 observers and 10 staff.

Proposed improvements to increase awareness of mandatory marking and remarking

Based on the results of the survey and data analysis, several improvement proposals were obtained which were grouped based on research variables, namely: accessibility, availability, quality, efficiency and effectiveness, as shown in table 6.

Table 6. Proposed Improvements by Variables

Fishbone Diagram Analysis Results		
Research Variables		Proposed Improvements
Accessibility	<ul style="list-style-type: none"> • Service locations are not easy to reach • Services are still arrival-oriented 	<ul style="list-style-type: none"> • Services are not carried out in one place. There is an additional service point at the market exit • Ball pick-up service. The service of visiting directly must be tagged / approaching a place

		of business where there are many mandatory teras
Quality	<ul style="list-style-type: none"> • Minimal information media • The number of illegal measuring instruments used 	<ul style="list-style-type: none"> • Digitize registration, scheduling, and re-marking information through the www.metrologi.malangkota.go.id website • The use of social media as a means of information can be through Instagram metrologi_kotamalang • Providing education to the mandatory tera related to the use of measuring instruments, by inviting the mandatory tera in training events on legal metrology, distributing brochures and conducting face-to-face education directly to the tera obligators.
Efficiency	<ul style="list-style-type: none"> • Limited service time • Lack of interaction between officers and mandatory 	<ul style="list-style-type: none"> • The increase in the number of service days is adjusted to the number of potential measuring instruments in the People's Market. So that it can improve service performance. • Provision of a call center to facilitate interaction/communication between officers and mandatory personnel. Must contact the call center at 081233815670
Effectiveness	<ul style="list-style-type: none"> • Lack of understanding of impressions and reimpresions • There must be an effect or pride when you have done the stamping and re-marking • Educate consumers as beneficiaries to be smart in making transactions using measuring tools 	<ul style="list-style-type: none"> • Providing status or information information on stalls or powders must be stamped and re-marked by providing stickers. • Create strategically installed banners containing information related to smart consumers
Tera Mandatory Awareness	<ul style="list-style-type: none"> • Frequently Changing Laws and Regulations • Sanctions that are not strict make the mandatory tera feel that tera and re-tera are not important 	<ul style="list-style-type: none"> • Always providing information updates to the mandatory tera through social media and brochures is very efficient in terms of time

- Lack of Oversight

- Give a verbal and written reprimand
- Conducting preventive and persuasive supervision by providing direction and guidance to the mandatory

Source: Results of data analysis and FGD, 2026

This must be a consideration for policy makers to create work programs related to access to services. Identify the service points that will be added after which an analysis of the service points to be carried out is carried out as an effort to see the impact caused. After that, the next stage is implemented to achieve the goals that have been compiled in the work program. With the addition of mandatory service points, there are no difficulties in carrying the measuring instrument, the time needed to perform services can be shorter. To achieve the implementation program implemented, monitoring will be carried out every 6 months to see the mandatory compliance of the tera in implementing the tera and re-marking carried out by the tera observer as an employee on duty in the field to supervise the results will be discussed in the meeting forum to provide input related to the implemented programs. Giving Reward & Punishment to the mandatory stamp, the mandatory stamp who does the stamp and re-stamp the measuring tool will be given a sticker to be attached to the stall or powder so that consumers can see. Then for those who do not do the marking and re-marking will be given punishment in stages at the beginning of the reprimand and then a reprimand letter will be given, if they still do not do the marking and re-marking then criminal sanctions will be given in accordance with Law no. 2 of 1980 concerning Legal Metrology.

CONCLUSION

Many factors result in a lack of awareness of mandatory marking and re-marking to carry out marking and re-marking measuring instruments, measures, weighs and their equipment at UPT. Legal Metrology of Malang City. Accessibility, Availability, Quality, Efficiency and Effectiveness are variables that are closely related to the concept of public services, namely transparency, accountability, conditionality, participation, equality of rights and balance of rights and obligations. Mandatory Stamp and Re-Stamp Awareness is influenced by the variables Accessibility, Availability, Quality, Efficiency and Effectiveness (X-free variable) on the level of mandatory stamping and re-stamping awareness (Y-bound variable) in UPT. Legal Metrology of Malang City where the variable X (free) is 75.6 percent so that the remaining 24.4 percent is determined by other factors.

Based on the results of the silent test of the free variable that affects the level of awareness of mandatory marking and remarking significantly, there are four variables, namely Accessibility, Quality, Efficiency and Effectiveness and there is one independent variable that is simultaneously insignificant, namely the availability variable. By analyzing using fishbone diagrams, it was found that the factors that caused the lack of awareness of mandatory marking and re-marking were access that was too far, difficulty in carrying tools, lack of information

media, lack of understanding of mandatory marking and re-marking, limited service time, no call center, lack of supervision, lack of attention from the government and no strict sanctions.

From the results of this study, the researcher provided solutions to improve the service system used by the UPT. Metrology in the form of an increase in the number of service points produced has resulted in an increase of 25% from 30 mandatory tera per day to 37 mandatory tera. The availability of a call center so that you must not queue again where the waiting time for queuing takes 30 minutes to 60 minutes. The installation of stickers on powder or kiosks that have implemented marking and re-marking has increased by 70.03% from before the change of only 27.68% based on data taken from respondents. The installation of banners so that consumers understand the measuring instruments used by the mandatory tera, currently installed in 2 people's markets, will gradually be installed in 22 people's markets and persuasive supervision will be carried out after the implementation of the tera, and re-impression.

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