# The Influence of Pdca (Plan, Do, Check, Act) Based on KPI (Key Performance Indicators) on Increasing the Performance of Librarians at Athirah Islamic School Makassar

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| Keywords: | Abstract |
|---|---|
| | This research aims to describe the influence of PDCA and KPI on performance, describe performance improvement and identify the influence of KPI-based PDCA in measuring performance improvement of Athirah Islamic School Librarians. The methodology used in this research is a quantitative research method with a descriptive approach with a sample size of 29 people from non-probability sampling using a saturated sample method. The data collection used was questionnaires and documents with a Likert scale which were analyzed using descriptive statistics, multiple regression analysis and performance measurement analysis. and validity, reliability, correlation and hypothesis tests were carried out. Based on the results of inferential statistical analysis processing, it was found that the PDCA variable (X1) has t = 0.382 with a probability (sig-t) of 0.00 < 0.05. The same thing was also found in the KPI variable (X2) with a value of t = 0.515 and a probability (Sig-t) of 0.00 < 0.05. Thus the PDCA and KPI variables have a significant influence on Performance (Y). Apart from that, the Fcount analysis produces a value = 350.228 with a probability (sig-F) of 0.00 < 0.05. This shows that there is a significant simultaneous influence between the PDCA (X1) and KPI (X2) variables on Performance (Y). The management of Athirah Islamic School pays more attention to the implementation of KPI-based PDCA in improving performance and pays more attention to factors that are considered to have an influence on librarian performance, both internal and external factors, and it is recommended for other researchers to explore topics, variables and the development of scientific studies. so that in the future it will provide new studies. |

## 1. Introduction

Human resources are the core element in the development of any organization. They play a crucial role in every organization, regardless of its form and objectives. Organizations are established with various visions aimed at serving human interests. Due to the significance of human resources, it is essential for every organization to have a qualified and productive workforce to carry out its activities. In the current information era, human resource management requires leaders who can align HR practices with organizational strategies to enhance performance and foster a culture that supports innovation (Dessler, 2003).

The PDCA cycle, which stands for Plan, Do, Check, and Act, is a continuous process improvement cycle, symbolized by a circle that has no end. PDCA is a widely-used four-step method in quality control for problem-solving.

The steps include Plan, Do, Check, and Act. Initially, PDCA was known as the "Shewhart cycle" because it was first introduced by Walter Shewhart several decades ago. However, it became more widely recognized as the "Deming cycle" due to its popularity and broad application, developed by Deming. Despite this, Deming always referred to the method as the Shewhart cycle, considering Shewhart the father of statistical quality control. PDCA is a valuable approach for making ongoing improvements (Tannady, 2015).

Athirah Islamic School Makassar is an Islamic educational institution that consistently innovates to develop its human resources, including leaders, educators, staff, and librarians. This enhancement of human resources significantly impacts their work processes. The library, as part of the Athirah Islamic School, is managed by librarians who, like leaders, teaching staff, and employees, are

required to continuously improve their human resources. This process is integral to the ongoing improvement process using the PDCA cycle (Plan, Do, Check, Act), where each phase involves meticulous planning, measurable and clear implementation, accurate evaluation, data analysis, and appropriate corrective action with monitoring, ensuring that it effectively addresses the problems within the organization.

Both companies and educational institutions need performance indicators to guide decision-making and achieve their goals and targets. One commonly used method is Key Performance Indicators (KPI). According to Parmenter, KPI is a set of measurements focused on the aspects of organizational performance that are most critical for the organization's success, both presently and in the future (Parmenter, 2010). This is supported by research from Wadongo, which shows that KPIs are essential navigation tools for managers (Wadongo, 2010). According to Marr, appropriate indicators will reveal performance and identify areas within the organization or institution that need attention (Marr, 2016).

It is crucial for libraries to focus on the quality of their human resources, as this can enhance the role and performance of librarians within the organization. Management must continually seek out, develop, and retain human resources that align with their needs to improve performance. In developing human resources, libraries need performance indicators to achieve quality human resources. Key Performance Indicators (KPI) can serve as a reference for librarians in achieving their work goals and measuring the extent to which they have successfully met these objectives (Hidayat, 2021).

Given the importance of PDCA and Key Performance Indicators in performance measurement activities for organizational institutions or libraries, this research focuses on the quality management development process using the Plan, Do, Check, Act cycle approach based on Key Performance

Indicators to measure improvements in librarian performance at the Athirah Islamic School Library, Makassar.

## 2. Literature Review

There are many perspectives from management experts regarding the meaning of management. However, generally, management activities in organizations are aimed at achieving goals effectively and efficiently. According to Terry (1973), as cited in Candra Wijaya's book, management can be described as the implementation of conceptions and the achievement of desired results through group efforts, which involve the use of human talents and other resources. This process includes directing and motivating human resources as well as other resources, such as raw materials, finance, methods, and markets, to achieve organizational goals.

Measurement and control provide managers with insights into business performance. Key Performance Indicators (KPIs) in quality control are processes designed to ensure that the KPIs set within an organization or company are properly measured and managed according to established standards. This performance measurement considers the business unit from four balanced perspectives: finances, customers, internal business processes, and learning and growth processes.

### 2.1 *Plan, Do, Check, Act* (PDCA)

PDCA, an abbreviation for Plan, Do, Check, Act, is a continuous improvement process that is carried out repeatedly. The PDCA cycle, also known as the Deming/Shewhart Cycle, is a quality management method used across various sectors, including industry, education, and other organizational fields. This cycle was popularized by Dr. Edwards Deming, an American expert in quality management, in the 1950s. PDCA is recognized as a highly effective method for continuous improvement. The PDCA cycle is primarily process-oriented, focusing on ongoing enhancements and improvements (Madan and Teli, 2015).

The implementation of the PDCA cycle (Plan, Do, Check, Act) and the mechanisms that ensure its continuous application are crucial. This approach is instrumental in achieving policies aimed at maintaining and improving standards. The cycle is a fundamental concept involving several stages: the planning stage, which includes setting improvement targets and formulating plans to achieve them; the checking stage, which involves assessing whether the implementation is proceeding as planned and monitoring the progress of improvements; and the action stage, which involves standardizing new procedures to prevent the recurrence of problems or setting new targets (Ahmad Yani, 2018).

One of the main advantages of the PDCA cycle is its adaptability to various types of activities. The steps within the PDCA cycle can be adjusted to meet specific needs. For example, in the context of process improvement, the PDCA cycle can be adapted into six steps: identifying potential improvements, describing current processes, analyzing these processes, planning and implementing changes, validating changes, and continuing improvements (Achmad Firdaus, 2018).

## 2.2 *Key Performance Indicators* (KPI)

According to Moeheriono (2012), Key Performance Indicators (KPIs) play a crucial role in designing a performance measurement system. It is essential that KPIs accurately reflect the company's vision, mission, strategy, and strategic goals. Typically, KPIs are determined through discussions between employees and leaders, often conducted via interviews or by reviewing internal company documents. KPIs present a set of metrics that focus on various aspects of company performance, emphasizing the company's success both in the present and the future.

Laksmita (2011) describes KPIs as measurable statements related to specific positions or roles within a company. These indicators are derived from the company's

vision and outline how the mission will achieve that vision. Each department further refines the KPIs, creating a job summary followed by task outcomes, which include a threshold to differentiate between the target value and the actual value. The objective is to prevent the organization from paying meaningless salaries and to ensure that employees are aware of their duties and responsibilities in achieving targets. KPIs also enable companies to administer rewards and punishments as a form of recognition or consequence for performance.

Arini (2016) explains that KPIs serve as an important element in organizational management, with the following main objectives: linking the vision, mission, value system, organizational strategy, and performance targets with the organization's activities to achieve the desired outcomes; measuring performance trends within the organization or its divisions, identifying significant increases or decreases; comparing current performance with historical data or with that of other organizations to understand strengths, weaknesses, and opportunities; using organizational KPIs as a foundation for setting KPIs or work targets for divisions and individuals; and using the results of KPI achievements as the basis for administering rewards and consequences, thereby motivating employees and promoting good behavior.

## 2.3 Performance

Performance originates from the definition of the word itself, often understood as achievement or work accomplishment. However, performance encompasses a broader meaning, extending beyond just work achievements to include the processes by which work is carried out. This is because performance is the outcome of work achievements that are linked to the organization's strategic goals, customer satisfaction, and contributions to the economy. Thus, performance is intrinsically related to the

job itself, involving both how the work is done and what is accomplished (Wibowo, 2008).

## 3. Research Methods
### 3.1 Type and Location of Research

This research uses a type of quantitative research, namely research that aims to describe the nature of something that is taking place, with the aim that the object being studied can be discussed in depth. Quantitative research can also be interpreted as a research method based on *positivist philosophy which is* used to research certain populations and samples, collect data using research instruments, data analysis is quantitative/statistical ( Sugiyono, 2013). The location in this research is the Athirah Islamic School which is located in Makassar City. The elements that are taken into consideration in selecting a research location are the place, actors and activities/activities.

### 3.2 Analysis Techniques

To determine the significance of *Plan, Do, Check, Act* (PDCA) based on *Key Performance Indicators* (KPI) in improving librarian performance, the author uses product moment correlation analysis techniques using the SPSS application ( *software* ).

This research uses multiple linear regression analysis techniques *(multiple linear regression method).* Multiple regression analysis is used to find out how close the relationship is between the unemployment variable (dependent variable) and the factors that influence it (independent variables).
The form of the regression equation can be made as follows:

| Model | R | R Square | Adjusted R Square |
|---|---|---|---|
| 1 | ,982 a | ,964 | ,961 |

$Y = \alpha + \beta 1 x 1 + \beta 2 x 2 + e$
Where,
Y = Performance
$\alpha$ = constant
$\beta 1 - \beta 3$ = regression coefficient of each variable
X1 = *Plan, Do, Check, Act* (PDCA)
X2 = *Key Performance Indicators* (KPI)

e = error term (nuisance variable) or residual.

### 3.3 Hypothesis testing

A hypothesis is an initial answer to the formulation of a research problem. The temporary term is used because the answer is only based on relevant theory, not yet based on empirical facts. Hypothesis testing is carried out with the aim of determining whether there is a significant influence between the independent (free) variable and the dependent (dependent) variable.

#### a. Joint or simultaneous testing

This test aims to find out whether the independent variables simultaneously or together significantly influence the dependent variable. This test uses the F test, namely by comparing the calculated F with the F table.

#### b. Partial or individual testing

The purpose of this test is to find out whether each independent variable significantly influences the dependent variable. Testing is carried out using the t test or t-test, namely comparing the t-count with the t-table.

## 4. Results and Discussion
### 4.1 Results
#### a. Hypothesis testing

In this research, hypothesis testing uses the F test and t test. The F test is carried out to prove the simultaneous influence of the independent variable on the dependent variable, while the t test is used to prove the partial influence of the independent variable on the dependent variable.

#### b. Coefficient of Determination Test

*R Square* value in table 88 above is 0.964, this shows that 96.4% of the dependent variable can be explained by the existing independent variables, namely PDCA ($X_1$ ) and KPI ($X_2$ ) which have an effect on performance. The remaining 3.6% is influenced by other variables not explained by this research model. So that the independent variable can explain the dependent variable strongly.

## c. F Test (Simultaneous)

To test the significance of the influence of the independent variable simultaneously on the dependent variable, the F test can be carried out. The steps taken in testing the first hypothesis are as follows :

a)   Determine the hypothesis formula

Ho : No significant effect, PDCA ($X_1$), and KPI ($X_2$) simultaneously on Performance (Y)

$H_a$ : There is a significant influence, PDCA ($X_1$), and KPI ($X_2$) simultaneously on performance (Y)

b)   Determine the magnitude of the calculated F value and the Significance of F (Sig-F)

c)   Determining the 5% significance level

d)   Determine hypothesis testing criteria

Ho $_{is}$ accepted if probability (sig-F) > 0.05

Ho $_{is}$ rejected if probability (Sig-F) < 0.05

The F test results produced based on the results of the multiple regression that have been carried out can be calculated as F 350.228 with a probability of 0.000, the value of which is smaller than 0.05, so Ha $_{is}$ accepted and Ho is $_{rejected}$ . This shows that there is a significant influence, PDCA ($X_1$) and KPI ($X_2$) simultaneously on librarian performance (Y).

## d. t Test (Partial)

To determine the partial influence of the independent variable on the dependent variable. then it can be done with the t test, namely by comparing the probability value or p-value (sig-t) with a significance level of 0.05. If the p-value is smaller than 0.05 then Ha is accepted, and conversely if the p-value is greater than 0.05 then Ha is rejected. Based on the results of the partial test (T test) carried out , it is known that the PDCA variable ($X_1$) obtained a t count of 0.382 with a probability of 0.000, a value below 0.05. Thus Ha is accepted, meaning that PDCA has a significant effect on performance (Y). Meanwhile, the KPI variable ($X_2$) obtained a t count of 0.515 with a probability of 0.000, which means that the value is below 0.05. Thus Ho is rejected, meaning that the KPI variable has a significant influence on performance (Y).

## 4.2  Discussion

Measuring the performance of employees and librarians at Athirah Islamic School is conducted using the PDCA (Plan, Do, Check, Act) management approach, grounded in Key Performance Indicators (KPI). This performance measurement is an evaluation process carried out by Athirah Islamic School to assess work results over a specific period. The school's performance assessment focuses on four key aspects, known as the Balanced Scorecard: Customer, Internal Business Process, Learning and Growth, and Financial Aspects.

However, some research only considers a few aspects of KPIs, highlighting the need for performance measurement that not only focuses on Balanced Scorecards and KPIs but also integrates several aspects, including the PDCA management approach as a complementary component. Therefore, research has been conducted to explore the impact of KPI-based PDCA management on improving the performance of librarians.

Quality management control combines process performance (PDCA) and outcome performance (KPI) to evaluate the results achieved in implementing product or service activities, with the goal of ensuring sustainable quality and fulfilling customer needs and satisfaction. The quality control process involves the PDCA cycle, which includes planning, execution, evaluation, and corrective action to address quality-related issues.

Based on the analysis, the application of performance measurement benefits from two methods: process performance measurement and outcome performance measurement. The analytical tool used for this performance measurement is the Maslahah Scorecard (MaSC). Performance improvement for employees and librarians at Athirah Islamic School is assessed through a KPI-based PDCA approach. However, statistical testing results indicate that not all aspects support the hypothesis, which will be explained in further detail below.

## a. PDCA

Based on the partial test results (T-test), the data reveals that the PDCA variable (X1) obtained a calculated t-value of 0.382 with a probability of 0.000, which is below the 0.05 threshold. This indicates that PDCA has a significant effect on performance (Y). The regression equation results also show that the PDCA variable has a positive regression coefficient, leading to the conclusion that PDCA is positively related to performance (Y).

This finding aligns with the process steps outlined by the Maslahah Scorecard theory, where the weight of each performance step (Wi) is calculated as 0.076, derived from 100% divided by the 13 process performance steps. Each process performance step holds the same value. The resulting value of 0.782 demonstrates that the influence of PDCA management on improving employee (librarian) performance is substantial, with a process performance score of 0.782. This indicates that KPI-based PDCA significantly supports the achievement of employee (librarian) performance, yielding beneficial results with an index value of "A."

## b. KPIs

For the KPI variable (X2), the t-value is 0.515 with a probability of 0.000, which is below the 0.05 threshold. This indicates that the KPI variable has a significant influence on performance (Y). The regression equation results show that the KPI variable has a positive regression coefficient, leading to the conclusion that the KPI variable has a unidirectional relationship with performance (Y). This means that as the KPI increases, performance will also improve.

This finding is consistent with the process steps outlined by the Maslahah Scorecard theory, where the weight of each performance step (Wi) is calculated as 0.25, derived from 100% divided by the 4 process performance steps. Each process performance step holds the same value. The resulting value of 1.00 indicates that the influence of KPI on improving employee (librarian) performance is significant, with a performance result score of 1.00. This demonstrates that the KPI-based PDCA approach effectively supports the achievement of employee (librarian) performance, yielding beneficial results with an index value of "A."

## 5. Conclusions

## 5.1 Conclusion

Based on the research results presented by the researcher regarding the influence of KPI-based PDCA management on improving the performance of Athirah Islamic School librarians, the following conclusions can be drawn:

1. PDCA Impact on Performance (X1): The PDCA management approach contributed significantly to improving the performance of Athirah Islamic School librarians, with a PDCA percentage of 84%. The research findings indicate that PDCA has a substantial influence on the probability of enhancing librarian performance. The relationship is positively correlated with profitability, meaning that as the effectiveness of PDCA increases, so does the profitability of librarian performance.

2. KPI Impact on Performance (X2): The KPI-based approach also played a crucial role in enhancing librarian performance, with a KPI percentage of 81%. This percentage is derived from the score managed by the researcher, showing that KPI has a significant impact on the probability of increasing librarian performance. Similar to PDCA, the KPI's influence is positively correlated with profitability, indicating that higher KPI levels result in improved employee/librarian performance.

3. Overall Performance Improvement (Y): The overall performance of Athirah Islamic School employees/librarians showed an increase, with a performance percentage of 85%. This percentage is based on the score managed by the researcher, indicating that the efforts made have effectively enhanced performance.

4. Significance of PDCA and KPI Management: The analysis demonstrates that both PDCA (X1) and KPI (X2) management approaches significantly influence the improvement of employee/librarian performance. The null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted, confirming the significant impact of these factors. Furthermore, the process steps based on the Maslahah Scorecard show that the KPI-based PDCA management approach effectively supports the achievement of librarian performance with beneficial results, earning an index value of "A."

These conclusions underscore the importance of using KPI-based PDCA management in performance improvement initiatives, as it has been shown to yield significant and positive results in the context of Athirah Islamic School librarians.

**5.2 Suggestion**

After presenting the research findings and conclusions, the researcher put forward several recommendations for consideration by academics, researchers and related parties. The following are some of the recommendations put forward:

1. The management of the Athirah Islamic School is advised to pay more attention to factors that are considered to have an influence on the performance of librarians, both internal and external factors. In this way, schools can improve their performance better.
2. More equip librarians with the knowledge and implementation process of PDCA and KPI so that implementation can actually support significant performance improvements.
3. For other researchers who wish to take up the same topic related to the title of this research, it is recommended to explore theory and add other variables that have not been studied and are considered to have an influence on improving performance.

4. In this research there are still many things that can be done to develop scientific studies regarding PDCA and KPI so it is hoped that in the future other researchers can provide new studies and different research methods.

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