Compliance Analysis of Perum Peruri as an Electronic Certification Provider in Implementing Business Practices Management Webtrust Certification Authorities

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ABSTRACT

Peruri is a trusted agency that collaborates with the Directorate General of Civil Registration and Population Administration (Ditjen Dukcapil) of the Ministry of Home Affairs of the Republic of Indonesia. It issues electronic certificates and electronic signatures using facial recognition authentication and compares live videos with Indonesian population data. This task demonstrates that Peruri is a trusted company in the field of digital security. In order to be recognized and maintain the credibility of the Certificate Policy (CP) and Certification Practice Statement (CPS) from Certification Authorities (CA) in the international community, Peruri needs to comply with various applicable standards. One of the international standards used is Webtrust for Certification Authorities. This study aims to analyze the capability level of Perum Peruri as an electronic certification provider in implementing Business Practices Management Webtrust Certification Authorities. The data used in this study consists of Perum Peruri's Certificate Policy (CP) and Certification Practice Statement (CPS). The analysis is conducted on the implementation of Business Practices Management Webtrust Certification Authorities based on the data of Perum Peruri's CP and CPS. Gap analysis is conducted to assess the alignment between Perum Peruri's CP and CPS with the principles of Business Practices Management Webtrust Certification Authorities. The results of the gap analysis indicate that no gaps are identified based on the checklist conducted by the author. This indicates that Perum Peruri's CP and CPS already comply with the principles set by Business Practices Management Webtrust Certification Authorities. This research significantly contributes to ensuring that Perum Peruri maintains compliance with international principles in the provision of electronic certification services. The findings of this study can serve as a reference for other electronic certification providers to improve and enhance the quality and security of their electronic certification management systems, particularly in the management of CP and CPS.

Keywords: Certification Authorities (CA), Certificate Policy (CP), Certification Practice Statement (CPS), Gap Analysis, Webtrust

1. INTRODUCTION

Perum Peruri is a State-Owned Enterprise (BUMN) formed through the merger of two entities, namely State Company (PN) Arta Yasa and PN Pertjetakan Kebajoran. In 2019, Peruri expanded its business by venturing into the digital security sector. Through Recognition Decree Number 790 of 2019, Peruri was included as an Electronic Certification Provider (PSrE) under the auspices of the Ministry of Communication and Informatics of the Republic of Indonesia. This means that Peruri is authorized to issue digital certificates that can be used to verify the identity of individuals engaging in digital transactions.

Peruri has been entrusted with a new task to produce electronic postage stamps in accordance with Government Regulation No. 86 of 2021, which covers the Procurement, Management, and Sale of Stamps. This task demonstrates that Peruri is a trusted company in the field of digital security. The trust given to Peruri by the government is significant because the digital industry is growing and will continue to thrive in the future.

The trust bestowed upon Peruri by the Indonesian government as an Electronic Certification Provider (PSrE) proves that Peruri has met strict requirements in managing electronic certification security. Peruri continues to develop its business in the field of digital security with the assurance of security and authenticity of electronic certificates. One of its tasks includes the issuance of electronic certificates and digital signatures, which requires strict adherence to international standards and guidelines. This ensures that Peruri maintains its credibility and reputation in the digital security sector.
contributor to the transformation of the digital security business is the establishment of Peruri CA, which is part of Peruri's Digital Security Strategic Business Unit (SBU). Peruri CA is a trusted entity that collaborates with the Population and Civil Registration Service (Ditjen Dukcapil) of the Ministry of Home Affairs of the Republic of Indonesia to issue electronic certificates and electronic signatures using face recognition authentication and live video comparison with Indonesian population data (Informatika, 2021). The CA creates certificates according to applicable standards, such as X.509, and signs them using a secret signature key. If a certification request does not include a public key, the CA will generate a key pair on behalf of the future certificate owner. The CA includes the public key of the key pair in the certificate and provides the private key to the certificate owner (Buchmann et al., 2013). The CA must disclose a Certificate Policy (CP) and Certification Practice Statement (CPS) as mandatory and foundational documents to describe its technical information security, business processes, and legal compliance (Yova Ruldeviyani, Arfve Gandhi, 2018).

Certificate Policy (CP) is a specific set of rules that determines the suitability of a certificate for a particular community or class of applications with common security requirements. Therefore, certificate policies are explicitly defined and made available to certificate users (Buchmann et al., 2013). In accordance with the Regulation of the Minister of Communication and Informatics of the Republic of Indonesia Number 11 of 2018 concerning Electronic Certification Management, Certificate Policy (CP) refers to the procedures and/or procedures written and used by Electronic Certification Providers for the use, registration, issuance, and revocation of Electronic Certificates. Meanwhile, the Certification Practice Statement (CPS) is the operational procedures provision of Electronic Certification Providers, including the procedures for issuing Electronic Certificates. In order to be recognized and maintain the credibility of CP and CPS from the CA's perspective in the international community, Peruri needs to comply with various applicable standards. One of the international standards used is Webtrust for Certification Authorities (Kementerian Komunikasi dan Informatika RI, 2023).

Webtrust for Certification Authorities (Webtrust CA) is a certification program developed by the American Institute of Certified Public Accountants (AICPA) and the Canadian Institute of Chartered Accountants (CICA), now known as CPA Canada. The program aims to ensure the security and trustworthiness of certification services provided by Certification Authorities (CPA Canada, 2017). Webtrust is a program that provides comprehensive assurance or protection to a business through the internet by building trust and reliability in a website (Elisabeth, 2019). A study found that the Webtrust service can ensure that information security, business practices, and transaction integrity meet the requirements of Webtrust principles and criteria (Chang et al., 2012).

The scope of this research is focused on the principles of Business Practices Management within the framework of Webtrust for Certification Authorities. Specifically, this research examines the alignment between Certificate Policy (CA, 2021) and Certification Practice Statement (CA, 2019) at Perum Peruri with the principles outlined in the Business Practices Management framework of Webtrust Certification Authorities.

The purpose of this research analysis is to assess the extent to which Perum Peruri's CP and CPS comply with these principles (Hafid Mukhlasin, 2017). This research does not cover a comprehensive evaluation of all operational aspects of Perum Peruri or electronic certification services as a whole. Instead, it focuses on assessing the CP and CPS in relation to the Business Practices Management principles within the Webtrust for Certification Authorities framework. The findings and conclusions of this research are limited to the examination of CP and CPS for compliance with the Business Practices Management principles of Webtrust Certification Authorities.

2. LITERATURE REVIEW

Based on previous studies related to the implementation of Webtrust audit principles at Bank Syariah Indonesia Branch Semarang, it was found that it could enhance users' trust in the technology (Saputra & Kiswara, 2022). Another study conducted a gap analysis to determine the misalignment between JSI's operational processes and ITIL 2011, revealing a result of 50.74%, indicating that more than half of the service operations at JSI do not conform to ITIL best practices (Restiana, Sella W; Susanto, Tony D; Tyas, 2015). The study suggested improving certain aspects of

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the documentation to ensure it meets the needs and can be implemented. From another research (Mario & Tjiptabudi, 2020), it was found that the civil servants and the community in Oebufu District have a high level of readiness in implementing information technology in their service activities. However, this does not guarantee a smooth implementation of Dilan (Digital Melayani) government operations. The contribution of this research to previous studies lies in its examination of a different subject by combining the principles of Webtrust audit and gap analysis.

3. METHOD

Method refers to a systematic approach employed to achieve a desired outcome. In the context of research, the term "research method" pertains to a procedural framework employed during the research process, encompassing activities such as data collection and analysis, as well as the exploration of existing phenomena (Zulkarnaen et al., 2020). In this study, the researcher conducted a literature review as part of the methodology. This aims to provide readers with information on the findings of previous studies closely related to the current research. This information is conveyed by connecting the research to existing literature and filling gaps in previous research (Wirapraja & Aribowo, 2018). The stages of the method can be found in Fig 1. The researcher examined previous research findings to analyze the readiness of electronic certification providers. This research is a field study, characterized by addressing issues related to the current context and conditions of the research subject and its interaction with the environment (Priadi, 2020). The field study involved analyzing the CP and CPS documents of Perum Peruri (Rijali, 2018). The selection of the location was purposeful, considering that Perum Peruri is a state-owned enterprise appointed by the Ministry of Communication and Informatics (Kominfo) as the Electronic Certification Provider in Indonesia.

Data collection involved observing the CP and CPS documents of Perum Peruri and analyzing their compliance with the Business Practices Management principles of Webtrust for Certification Authorities. The data analysis was conducted using the GAP Analysis method. GAP Analysis is defined by the IT Infrastructure Library (ITIL) as a process that compares two types of data or information and identifies the differences between them (Ruswita, 2022).

Fig 1 Method flowchart

Data collection involved observing the CP and CPS documents of Perum Peruri and analyzing their compliance with the Business Practices Management principles of Webtrust for Certification Authorities. The data analysis was conducted using the GAP Analysis method. GAP Analysis is defined by the IT Infrastructure Library (ITIL) as a process that compares two types of data or information and identifies the differences between them (Ruswita, 2022).
GAP Analysis refers to the comparison between the actual state and the desired state that has been established. It is used to evaluate the Certificate Policy (CP) and Certification Practice Statement (CPS) of Perum Peruri by comparing them with the principles set forth by Webtrust for Certification Authorities in the category of Business Practices Management. The goal of gap analysis is to identify differences or gaps between current practices and the desired future state. This analysis model is based on the researcher's assumptions, comparing the CP and CPS of the company with the standards set by Webtrust for Certification Authorities (Ruswita, 2022).

GAP analysis serves as a valuable tool to assess the alignment of Perum Peruri's CP and CPS with industry best practices. By identifying areas where current practices differ from established standards, the organization can pinpoint specific areas for improvement and take necessary steps to bridge those gaps. This analysis provides valuable insights that can guide Perum Peruri in achieving the desired state and ensuring compliance with industry standards. Ultimately, conducting a comprehensive GAP analysis enables Perum Peruri to enhance its business practices, strengthen trust, and meet the expectations of stakeholders and customers in this dynamic field.

The GAP assessment is conducted by assigning weights per control and evaluating the alignment of activities in JSI with ITIL quantitatively. The explanation of the given values is as follows (Restiana, Sella W; Susanto, Tony D; Tyas, 2015): Weight: Determined for each process for the 3 criteria within the Business Practices Management category. Each process is assigned a total weight of 100% divided per control. The result of this division represents the weight per control. Control Value: The next assessment method involves matching the current conditions with the conditions specified in Webtrust CA. This matching is accompanied by a checklist, where a check mark (✓) indicates compliance, and a dash (-) indicates non-compliance. Subtotal and Total: Subtotal is the value obtained by multiplying the weight and control value. The accumulation of subtotals becomes the total value for a process. Furthermore, the total value is accumulated again and the average is calculated, yielding the average value for all processes. GAP Value: The GAP value is obtained by subtracting the highest alignment percentage (i.e., 100%) from the average percentage of all processes within the Business Practices Management category.

4. RESULT

In this study, the researcher found that the Certification Practice Statement (CPS) and Certificate Policy (CP) documents owned by Perum Peruri have been compared to Webtrust for Certification Authorities based on the CA Business Practices Management principles. This was done to assess the level of alignment between the documents and the established standards. After conducting the examination, the researcher created a checklist that includes various criteria that must be met by electronic certification providers in implementing Webtrust CA under the CA Business Practices Management principles.

CA Business Practices Management is a business management principle aimed at ensuring effectiveness and operational efficiency in the provision of electronic certification services. In this context, the Certification Authority must maintain effective control to provide assurance that the electronic certification services provided comply with the Certification Practice Statement (CPS) and Certificate Policy (CP). The results of the study can be found in Table 1, Table 2, and Table 3.
<table>
<thead>
<tr>
<th>Control</th>
<th>Applicable standards</th>
<th>Current condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Policy Authority (PA) possesses ultimate authority and responsibility for granting approval to the Certification Practice Statement (CPS) of the Certification Authority (CA).</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Formal assignments have been made for the maintenance of the CPS.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>The CA's CPS undergoes modifications and obtains approval in adherence to a specified review process.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>The CA ensures that its Certification Practice Statement (CPS) is accessible to all relevant parties.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Revisions made to the CA's CPS are made available to the appropriate parties.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>The CA regularly updates its CPS to accurately reflect changes occurring in the environment.</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Based on Table 1, the results indicate that the Accreditation Authority (AA) plays a crucial role as the ultimate authority and responsibility in approving the Certification Practice Statement (CPS) of the Certification Authority (CA). The AA is tasked with maintaining and preserving the CPS. Any changes made to the CA's CPS must go through the established review and approval process. Additionally, the CA is responsible for providing the CPS to all authorized parties, including its revisions. The CA is also obligated to actively update the CPS to reflect changes occurring in the relevant environment. With the involvement of the AA and the commitment of the CA in maintaining and updating the CPS, it ensures that the policies and procedures documented in the CA's CPS remain relevant, in accordance with the applicable standards, and capable of maintaining the integrity and security of the issued certificates.

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Table 2
Certificate Policy (CP) Management

<table>
<thead>
<tr>
<th>Control</th>
<th>Applicable standards</th>
<th>Current condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Policy Authority (PA) is accountable for establishing the</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>business requirements and policies regarding the usage of digital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>certificates, and documenting them in a Certificate Policy (CP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>along with related agreements.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The PA possesses ultimate authority and responsibility for defining</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>and approving Certificate Policy(s).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificate Policy(s) undergo approval by the Policy Authority</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>through a well-defined annual review process, which includes the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>responsibilities of maintaining and tracking any modifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>made to the Certificate Policy(s).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A structured review process is in place to evaluate the suitability</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>of the Certificate Policy(s) for support by the controls specified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in the Certification Practice Statement (CPS).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The PA ensures that the Certificate Policies supported by the</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Certificate Authority (CA) are accessible to Subscribers and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relying Parties.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 2, the obtained results highlight the importance of establishing business requirements and policies for the use of digital certificates in order to maintain their security and integrity. The responsibility for defining business requirements and policies for the use of digital certificates and incorporating them into the Certificate Policy (CP) and supporting agreements lies with the Accreditation Authority (AA). The AA also has the ultimate authority and responsibility in the approval process of the CP.

The CP is approved through an established annual review process. The purpose of this review process is to evaluate whether the CP is still supported by the controls described in the Certification Practice Statement (CPS). As part of their responsibilities, the AA develops the CP supported by the Certification Authority (CA) and ensures its availability to subscribers and relying parties.

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With stringent oversight from the AA and a structured annual review process, it can be ensured that the approved CP remains relevant, compliant with policies and regulations, and capable of providing trust and security in the use of digital certificates for all parties involved.

<table>
<thead>
<tr>
<th>Control</th>
<th>Applicable standards</th>
<th>Current condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>The PA has the responsibility to ensure that the control processes of the CA, as described in a Certification Practice Statement (CPS) or its equivalent, fully adhere to the requirements of the CP.</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>The CA considers the requirements of the CP when formulating its CPS.</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>The CA evaluates the impact of proposed changes to the CPS to ensure their alignment with the CP.</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>There is a well-defined review process in place to ensure that the Certificate Policy(s) are supported by the CA's CPS.</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

Based on Table 4.3, the research findings indicate that the Policy Authority (PA) has a crucial responsibility in ensuring that the CA's control processes align with the provisions outlined in the Certificate Practice Statement (CPS) and comply with the requirements of the Certificate Policy (CP). The PA actively participates in the discussion of CP requirements when the CA develops their CPS. Additionally, the CA also plays a role in evaluating the proposed changes to the CPS to ensure alignment with the CP. There is a defined review process to ensure that the CP is fully supported by the CA's CPS.

The actions taken by the PA and CA in controlling and evaluating these processes are essential steps in maintaining compliance with CP requirements and ensuring that all actions taken by the CA align with established policies. With strict oversight and systematic evaluation, it can be ensured that the CP remains consistent with applicable regulations and requirements, while supporting the integrity and security in the provision of certification services.

The researcher conducted a gap analysis measurement by comparing the readiness of the electronic certification provider against the criteria listed in the checklist. The results of the gap analysis, comparing the current state with the Webtrust standards in the category of Business Practices Management, can be seen in Table 1, Table 2, and Table 3.

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## Table 4

<table>
<thead>
<tr>
<th>Table Name</th>
<th>Sum of Control</th>
<th>Weight per Control</th>
<th>Attainment Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPS Management</td>
<td>6</td>
<td>16.67%</td>
<td>100%</td>
</tr>
<tr>
<td>CP Management</td>
<td>5</td>
<td>20%</td>
<td>100%</td>
</tr>
<tr>
<td>CPS and CP Consistency</td>
<td>4</td>
<td>25%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on Table 4.4, the Business Practices Management Score is obtained, where each criterion achieves a weight score of 100% attainment. Subsequently, the gap value between the current state and the Webtrust CA standard can be calculated as follows:

\[
\text{Gap Value} = 100\% - \text{average process attainment}
\]

\[
= 100\% - 100\% \\
= 0\%
\]

With a gap value of 0%, it indicates that the Certification Practice Statement (CPS) and Certificate Policy (CP) documents held by Perum Peruri are in compliance with the Webtrust for Certification Authorities regulations in the aspect of CA Business Practices Management. Therefore, Perum Peruri, as an electronic certification provider, has fulfilled one of the principles established by the Webtrust for Certification Authorities in the CA Business Practices Management principle.

### DISCUSSIONS

The analysis conducted on the Certificate Policy (CP) and Certification Practice Statement (CPS) data obtained from Peruri, utilizing the principles of CA Business Practices Management in Webtrust for Certification Authorities, and employing the gap analysis method, concludes that Peruri's CP and CPS are in accordance with these principles and have met the requirements and standards established in the CA Business Practices Management of Webtrust for Certification Authorities. In other words, this indicates that Peruri has implemented policies and procedures consistent with international standards in the provision of electronic certification services.

The findings of this study affirm Peruri's commitment to maintaining and updating its Certification Practice Statement and Certificate Policy, ensuring that they align with the industry standards set by Webtrust for Certification Authorities. The active involvement of the Policy Authority (PA) in the development of CP and the evaluation of proposed changes to CPS demonstrates Peruri's dedication to compliance and continuous improvement.

By adhering to the CA Business Practices Management principles, Peruri safeguards the integrity and security of the certificates it issues. The establishment of clear business requirements and policies for the use of digital certificates further reinforces the importance of maintaining the confidentiality, availability, and authenticity of these certificates.

The results of the gap analysis indicate that Peruri has achieved a perfect score in the Management of Business Practices. This suggests that Peruri's current CP and CPS align completely with the standards defined by Webtrust for Certification Authorities, leaving no gaps or deviations from the expected practices.

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These findings have significant implications for Peruri as an electronic certification provider. By adhering to international standards and best practices, Peruri ensures that its services are trustworthy, reliable, and consistent with the expectations of stakeholders and customers. The successful alignment of Peruri's CP and CPS with the CA Business Practices Management principles reinforces Peruri's credibility as a certification authority and enhances its position in the dynamic field of electronic certification.

Further research and analysis can explore other dimensions of Peruri's certification practices and assess its alignment with additional industry standards and frameworks. Continued efforts in maintaining and improving business practices will contribute to Peruri's ability to provide secure and reliable electronic certification services in an ever-evolving digital landscape.

In conclusion, the findings of this study affirm that Peruri has successfully implemented and aligned its Certificate Policy and Certification Practice Statement with the principles of CA Business Practices Management. The thorough analysis and adherence to international standards demonstrate Peruri's commitment to excellence in electronic certification services. These results contribute to the broader field of certification authorities by providing insights into best practices and highlighting the importance of aligning policies and procedures with industry standards.

5. CONCLUSION

Based on the analysis conducted on the Certificate Policy (CP) and Certification Practice Statement (CPS) data obtained from Peruri, and utilizing the principles of CA Business Practices Management within Webtrust for Certification Authorities, it can be concluded through gap analysis methodology that Peruri's CP and CPS are aligned with these principles and have fulfilled the requirements and standards established in CA Business Practices Management by Webtrust for Certification Authorities. The findings of the analysis demonstrate that Peruri has effectively incorporated the necessary controls and practices outlined in the CA Business Practices Management framework. By adhering to these guidelines, Peruri has ensured the integrity, security, and compliance of its electronic certification services. The comprehensive evaluation of the CP and CPS has confirmed that Peruri's documentation aligns with the best practices and industry standards outlined by Webtrust for Certification Authorities. In conclusion, the analysis utilizing the gap analysis methodology confirms that Peruri's CP and CPS comply with the principles outlined in the CA Business Practices Management framework by Webtrust for Certification Authorities. This affirmation underscores Peruri's adherence to international standards and its commitment to providing trustworthy electronic certification services.

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We would also like to extend our thanks to the Policy Authority (PA) and Certificate Authority (CA) involved in this study. Their active participation and valuable insights were instrumental in understanding the implementation of CA Business Practices Management and its alignment with the Webtrust for Certification Authorities standards.

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