Jurnal Reviu Akuntansi dan Keuangan, Vol. 15 No. 02, p. 440-462

Website:
ejournal.umm.ac.id/index.php/jrak

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DOI: 10.22219/jrak.v15i2.40688

Citation:
Isrok, M., Siswantoro, D. (2025). Optimizing National Health Insurance Contributions: The Role of Regional Government Contribution Reconciliation Application. Jurnal Reviu Akuntansi Dan Keuangan, 15(2), 440-462.

Article Process
Submitted:
March 8, 2025

Reviewed:
March 13, 2025

Revised:
June 5, 2025

Accepted:
June 5, 2025

Published:
July 3, 2025

Office:
Department of Accounting
University of
Muhammadiyah Malang
GKB 2 Floor 3.
Jalan Raya Tlogomas 246,
Malang, East Java,
Indonesia

P-ISSN: 2615-2223
E-ISSN: 2088-0685

Article Type: Research Paper

OPTIMIZING NATIONAL HEALTH INSURANCE CONTRIBUTIONS: THE ROLE OF REGIONAL GOVERNMENT CONTRIBUTION RECONCILIATION APPLICATION

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ABSTRACT

Purpose: This study aims to provide suggestions for improving the implementation of the Regional Government Contribution Reconciliation Application in helping to calculate health insurance contributions accurately so as to optimize the revenue of the National Health Insurance (JKN) contribution to Social Health Insurance Administration Agency, especially the Regional Civil Servant segment.

Methodology/approach: This research uses a qualitative approach in the form of a case study conducted at Social Health Insurance Administration Agency as the unit authorized to formulate policies related to national health insurance contributions. The method used is Soft System Methodology with the Governance, Risk, Compliance (GRC) framework and the Unified Theory of Acceptance and Use of Technology (UTAUT). The data collection method consists of secondary data for literature analysis and contribution data analysis. The primary data collection method is carried out to analyze the results of interviews. The sources of this research are related officials within the scope of Social Health Insurance Administration Agency and the Regional Government.

Findings: The results showed that the implementation of ARIP still faces two main obstacles, namely the absence of commitment from the Regional Government to consistently use ARIP, and the lack of integration between ARIP and the payroll system used by each Regional Government. These two problems hinder the optimization of the use of information technology in the JKN contribution calculation process.

Practical implications: Stronger policy interventions from the central government are needed, such as mandatory regulation of the use of ARIP by regional governments as well as the provision of technical integration platforms that are compatible with various regional payroll systems.

Originality/value: This research was conducted using a case study method in the unit authorized to formulate policies in the field of national health insurance contributions and the use of the Regional Government Contribution Reconciliation Application. This study offers actionable strategies for decision makers in the implementation of ARIP.

Keywords: BPJS Kesehatan; Governance, Risk, and Compliance (GRC); Regional Government Contribution Reconciliation Application (ARIP); Unified Theory of Acceptance and Use of Technology (UTAUT).

ABSTRAK

Tujuan penelitian: *Penelitian ini bertujuan untuk memberikan usulan perbaikan implementasi Aplikasi Rekonsiliasi Iuran Pemerintah Daerah (ARIP) dalam membantu menghitung iuran jaminan kesehatan secara akurat sehingga dapat mengoptimalkan pendapatan iuran Jaminan Kesehatan Nasional (JKN) pada BPJS Kesehatan khususnya segmen PNS Daerah.*

Metode/pendekatan: *Penelitian ini menggunakan pendekatan kualitatif berupa studi kasus yang dilakukan pada BPJS Kesehatan selaku unit yang berwenang merumuskan kebijakan terkait iuran jaminan kesehatan nasional. Metode yang digunakan adalah Soft System Methodologhy dengan kerangka kerja Governance, Risk, Compliance (GRC) serta Unified Theory of Acceptance and Use of Technology (UTAUT). Metode pengumpulan data terdiri dari data sekunderuntuk analisis literatur dan analisis data iuran. Metode pengumpulan data primer dilakukan untuk analisis hasil wawancara. Narasumber penelitian ini merupakan pejabat terkait pada lingkup BPJS Kesehatan dan Pemerintah Daerah.*

Hasil: *Hasil penelitian menunjukkan bahwa penerapan ARIP masih menghadapi dua kendala utama, yaitu belum adanya komitmen dari Pemda untuk secara konsisten menggunakan ARIP, serta belum terbangunnya integrasi antara ARIP dan sistem penggajian yang digunakan oleh masing-masing Pemda. Kedua masalah ini menghambat*

optimalisasi penggunaan teknologi informasi dalam proses perhitungan iuran JKN.

Implikasi praktik: *Diperlukan intervensi kebijakan yang lebih kuat dari pemerintah pusat, seperti regulasi wajib penggunaan ARIP oleh Pemda serta penyediaan platform integrasi teknis yang kompatibel dengan berbagai sistem penggajian daerah.*

Orisinalitas/kebaharuan: *Penelitian ini dilakukan dengan metode studi kasus pada unit yang berwenang merumuskan kebijakan di bidang iuran jaminan kesehatan nasional dan penggunaan Aplikasi Rekonsiliasi Iuran Pemda. Studi ini menawarkan strategi yang dapat ditindaklanjuti bagi para pengambil keputusan dalam implementasi ARIP.*

Kata kunci: *Aplikasi Rekonsiliasi Iuran Pemda (ARIP); BPJS Kesehatan; Governance, Risk, and Compliance (GRC); Unified Theory of Acceptance and Use of Technology (UTAUT).*

INTRODUCTION

Social Health Insurance Administration Agency has a role in managing the health insurance program and is directly responsible to the President. Regulations governing the technical management of Social Health Insurance Administration Agency are contained in Presidential Regulations (Perpres75/2019). Currently, the applicable regulation is Presidential Regulation Number 82 in year 2018 (Perpres82/2018) on Health Insurance, which has been amended three times, most recently Presidential Regulation 59 of 2024 (Perpres59/2024) on the Third Amendment to Presidential Regulation 82/2018 on Health Insurance.

One of the changes in 2019 to Presidential Regulation82/2018 as stipulated in Presidential Regulation 75 of 2019 is the calculation of health insurance contributions (contributions), especially for Regional Civil Servants, which originally consisted only of basic salary and family allowances to basic salary, family allowances, position allowances, professional allowances and performance allowances or so-called additional income.

With the issuance of Presidential Regulation 75/2019, the basis for calculating contributions must take into account three additional components, namely position allowances or general allowances, professional allowances and additional income. The provision of calculations using five components for Regional Civil Servants (PNSD) takes effect from January 2020. The component of position allowance or general allowance is paid together with the main salary so it is not a problem if it is added. The changes in the policy for calculating the Regional Civil Servant Contribution are shown in Table 1 below:

Segment	Presidential Regulation82/2018	Presidential Regulation75/2019
Basis of calculation	1. Basic salary or wages 2. Family allowance	1. Basic salary or wages 2. Family allowance **3. Position allowance or general allowance**

	4. Professional allowance **5. Additional income**	
Composition	- 2% paid by the employee - 3% paid by the employer	- 1% paid by the employee - 2% paid by the employer
Percentage	5% of the Contribution Calculation Basis	5% of the Contribution Calculation Basis
Lower bound	Not regulated	Not regulated
Upper bound	Rp8,000,000.00	Rp12,000,000.00

Table 1. Changes in Regional Civil Servant Contribution Calculation Policy

Source: Presidential Regulation 82/2018 on Health Insurance and Presidential Regulation 75/2019 on Amendments to Presidential Regulation 82/2018

In resolving these challenges, Social Health Insurance Administration Agency continues to mitigate risks to ensure that contribution revenues are realized through monitoring the availability of regional government budgets in paying Regional Civil Servant contributions in their respective work units in accordance with Presidential Regulation75/2019 (Innocenti et al., 2019). One of the efforts made by Social Health Insurance Administration Agency in minimizing any underpayment related to contributions from the Regional Civil Servant segment is to create an innovation in the form of the Regional Government Contribution Reconciliation Application (ARIP) which is a web-based application used to calculate JKN Contributions for the Regional Civil Servant segment quickly, precisely, and easily. The implementation of ARIP began on May 01, 2021 in accordance with the letter of the Deputy Director for Fee Management number 5169/IV.1/0421 dated April 26, 2021 concerning the Implementation of the Regional Government Contribution Reconciliation Application. ARIP involves collaboration with stakeholders, namely the head of office and treasurer of each OPD (Regional Apparatus Organization) and Satker (work unit) in the Regional Government. Currently, in its implementation, ARIP is used not only to ensure the accuracy of the amount of contributions that must be paid by Regional Civil Servants, but can also be a reference in the budgeting process within the Regional Government (Jath et al., 2024).

Utilization of the Regional Government Contribution Reconciliation Application (ARIP) began in 2021. However, until 2024 the average utilization of the ARIP application in 2024 is still at 60.01% highlights a significant gap between the system's potential and its actual use. This moderate adoption rate indicates persistent challenges in fully implementing ARIP, which may hinder the optimization of JKN contribution revenue. Such limited utilization suggests that key factors influencing technology acceptance—such as performance expectancy, effort expectancy, social influence, and facilitating conditions as outlined in the UTAUT framework—have not been sufficiently addressed, as shown in Table 2 below. Based on historical data, the average application of the ARIP application in 2021 was 9.48%, in 2022 it was 51.26% and in 2023 it was 65.47%. So, when viewed, the average use of ARIP from 2021 to 2024 still reaches 46.56%. This shows that there are possible problems in its implementation / application so that the percentage of ARIP users has not optimally reached 100%. Such suboptimal usage is problematic because it limits the system's effectiveness in accurately reconciling JKN contributions, which can lead to revenue leakage and inefficiencies in fund management. Furthermore, incomplete adoption hinders data consistency and integration across regional governments, increasing the risk of errors and delays in contribution processing. Without full utilization, the intended benefits of

transparency, accountability, and improved financial performance within the JKN program cannot be fully realized, ultimately affecting the sustainability of the national health insurance system.

Referring to the previous explanation, the purpose of this study is to analyze how the implementation of the implementation of the Regional Government Fee Reconciliation Application in Optimizing JKN Fee Revenue and the problems that occur in the flow or process of implementing the application. Research on the implementation of ARIP has not been carried out before because of its implementation and implementation which began in 2021.

Table 2. The Utilization of Regional Government Contribution Reconciliation Application from 2021 to 2024

Regional Office	Local Government	2021	2022	2023	2024	Average
1	58	3,56%	97,81%	97,27%	86,14%	71,19%
2	53	0,00%	44,93%	55,74%	60,69%	40,34%
3	53	34,28%	65,41%	77,71%	67,69%	61,27%
4	25	15,92%	80,33%	88,25%	75,50%	65,00%
5	28	6,25%	68,97%	74,40%	69,64%	54,82%
6	42	0,00%	43,11%	85,12%	83,68%	52,98%
7	39	19,66%	63,94%	73,34%	77,62%	58,64%
8	46	23,23%	45,88%	71,29%	57,88%	49,57%
9	62	5,04%	35,11%	50,64%	44,59%	33,85%
10	48	0,00%	23,57%	40,19%	28,08%	22,96%
11	44	9,85%	38,59%	45,27%	43,28%	34,24%
12	48	0,00%	23,05%	41,02%	39,76%	25,95%
Total	**546**	**9,48%**	**51,26%**	**65,47%**	**60,01%**	**46,56%**

Source: Utilization Report of ARIP by the Health Social Security Administration Agency in April 2025 (processed)

To ensure that the governance process runs effectively and efficiently, each work unit that has diverse tasks and functions must operate in accordance with established rules and procedures (Sari, 2021). Work units are also faced with the risk that established governance-related regulations will not achieve the expected results, or that circumstances beyond the control of the work unit will affect those results. Therefore, work units must manage these risks at all levels of the organization.

This condition relates to BPJS Kesehatan, especially in its duties that include calculating and receiving National Health Insurance (JKN) contributions. In determining the amount of contributions, there is a process that involves various income components as the basis for calculation as well as coordination with various work units and related parties (Perpres75/2019, 2019). The calculation of JKN contributions has an important role in ensuring an optimal level of revenue to reduce the risk of underpayment due to inaccuracies in the calculation process (Jath et al., 2024). The Indonesian GRC Forum, a professional platform established in October 2018, aimed at promoting the integrated and holistic implementation of Governance, Risk, and Compliance (GRC) practices across organizations in Indonesia, has developed guidelines to achieve the GRC Model as a reference to improve GRC implementation. This GRC excellence model targets both the public sector and the private sector. The ideal conditions achieved in this excellence model are learning, adaptability, innovation, and sustainability. These ideal conditions are reflected in all elements/aspects of excellence, namely process, people, and tools (Vicente & Mira da Silva, 2011).

Previous studies have explored various dimensions of National Health Insurance (JKN) contributions and public sector digital adoption, yet few have addressed the institutional implementation of reconciliation systems such as ARIP. Firdaus and Wondabio (2019) analyzed the financial sustainability of JKN by comparing contribution revenues and healthcare expenditures, but did not investigate the role of digital systems in improving revenue accuracy. Similarly, Fajrini et al. (2021) examined non-compliance among non-wage JKN participants, focusing primarily on individual behavior rather than institutional processes. Studies by Adauwiyah (2023) and Santoso and Rachmawati (2021) applied the UTAUT2 model to examine user acceptance of digital banking applications, emphasizing ease of use, performance expectancy, and facilitating conditions. However, these studies were limited to the private sector and did not address public institutional dynamics, such as policy mandates and inter-agency coordination. While Yuhani and Setyaningrum (2024) and Putra (2021) contributed to the discourse on asset management and bureaucratic reform, their works did not incorporate digital systems for financial reconciliation nor explore their effect on health financing. These gaps highlight the limited attention given to the real-world application of ARIP in optimizing JKN contributions through local government institutions.

This study seeks to address that gap by offering a novel contribution through an empirical investigation of ARIP implementation within regional governments. It uniquely combines public governance theory with the UTAUT framework to examine how institutional commitment, system interoperability, regulatory enforcement, and operator competence shape the successful adoption of ARIP. By focusing on the technical, procedural, and political factors influencing digital system uptake in the public health financing domain, this research provides actionable insights for national stakeholders such as BPJS Kesehatan and the Ministry of Home Affairs. Unlike prior studies that isolated either financial performance or user behavior, this study adopts a holistic approach that bridges technological adoption and institutional reform, offering a fresh perspective on how regional digital tools can be leveraged to optimize national health insurance contribution management.

The component criteria for the process phase are as follows the distribution of information and communication is relevant, transparent, reliable and timely, continuous and excellent learning and innovation, effective governance with appropriate definition of structure and duties, and considered with effective risk management and sustainable business strategy. The component criteria for the people phase are as follows development of integrity and reliable human resources, continuous knowledge improvement and effective performance measurement, and providing appropriate performance and rewards. The component criteria for the Tools phase are information systems effectively support decision making and effective surveillance systems to monitor objective deviations and new threats s (GRC Forum Indonesia, 2020).

The UTAUT model is a model developed by Venkatesh and is integrated (Venkatesh et al., 2003). The UTAUT model has proven to be more successful than eight other technology acceptance theories to explain up to 70% of user variance (Taiwo & Downe, 2013; Nasir, 2013). Furthermore, the UTAUT model experienced the addition of several variables (Venkatesh et al., 2012). The old UTAUT model has four key constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions that have an influence on behavioral intentions to use technology.

Performance expectancy is the extent to which people believe that using the system will help them to achieve benefits in certain jobs or activities. Effort expectancy is the level of simplicity associated with using the system/technology by users. Social influence is the

realization of people who believe that others are better off using the system/technology. Supporting conditions refer to the extent to which a person believes that technical infrastructure and organizational support are available to support the use of technology (Venkatesh et al., 2012).

This study explores the implementation of the Regional Government Contribution Reconciliation Application (ARIP) to optimize BPJS Health JKN contributions by integrating the modified UTAUT framework with a Governance, Risk, and Compliance (GRC) perspective. The UTAUT model is relevant to this study as it explains the factors influencing the acceptance and use of the ARIP application by regional government operators. Key factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions are examined alongside governance structures, risk mitigation efforts, and compliance mechanisms. This framework helps identify adoption barriers and supports the formulation of targeted strategies to improve ARIP implementation in optimizing JKN contribution revenue. The research seeks to answer: What organizational, technological, and institutional factors influence the successful implementation of ARIP in regional governments to enhance JKN contribution outcomes. The study contributes by offering an integrated analytical lens that addresses both user acceptance and institutional readiness, providing theoretical advancement through UTAUT-GRC integration and practical guidance for policymakers and public institutions in digital health contribution management.

METHOD

The research conducted is qualitative research with a case study method using problem solving research, which is one type of case study research with the aim of identifying the root causes of problems in the organization under study, therefore it is recommended to identify the root and cause of the problem and follow-up to overcome it (Ellet, 2018). The aim is to identify the main causes of problems in the implementation of the implementation of the Regional Government Fee Reconciliation Application (ARIP) in order to optimize the revenue to be received from JKN contributions.

This research was conducted using soft systems methodology (SSM) because the problems in the implementation process of the Regional Government Fee Reconciliation Application in optimizing JKN contribution revenue are complex. This research employs Soft Systems Methodology (SSM) because it is particularly well-suited for addressing multifaceted and human-centered problems characterized by ambiguity, conflicting stakeholder perspectives, and evolving organizational contexts. Unlike traditional hard systems approaches that assume clear, well-defined problems, SSM facilitates understanding and structuring complex social situations through iterative learning and stakeholder engagement. In the case of implementing the Regional Government Fee Reconciliation Application, where technical, organizational, and behavioral factors intertwine, SSM enables a holistic exploration of these interrelated issues, fostering consensus-building and adaptive solutions that go beyond purely technical fixes. In addition, the process involves various parties or actors who are interconnected and influence each other. Soft system methodology (SSM) is a methodology that uses certain fundamentals to solve unstructured problems. SSM users do learning by:

a. Identifying the main problems that occur (finding out);
b. Modeling to solve the problems that have been identified (modeling) include CATWOE analysis;
c. Comparing conceptual models with the real world (using models to structure debate);

d. Formulating problem solving steps (defining/taking action).
as illustrated in Figure 1 below:

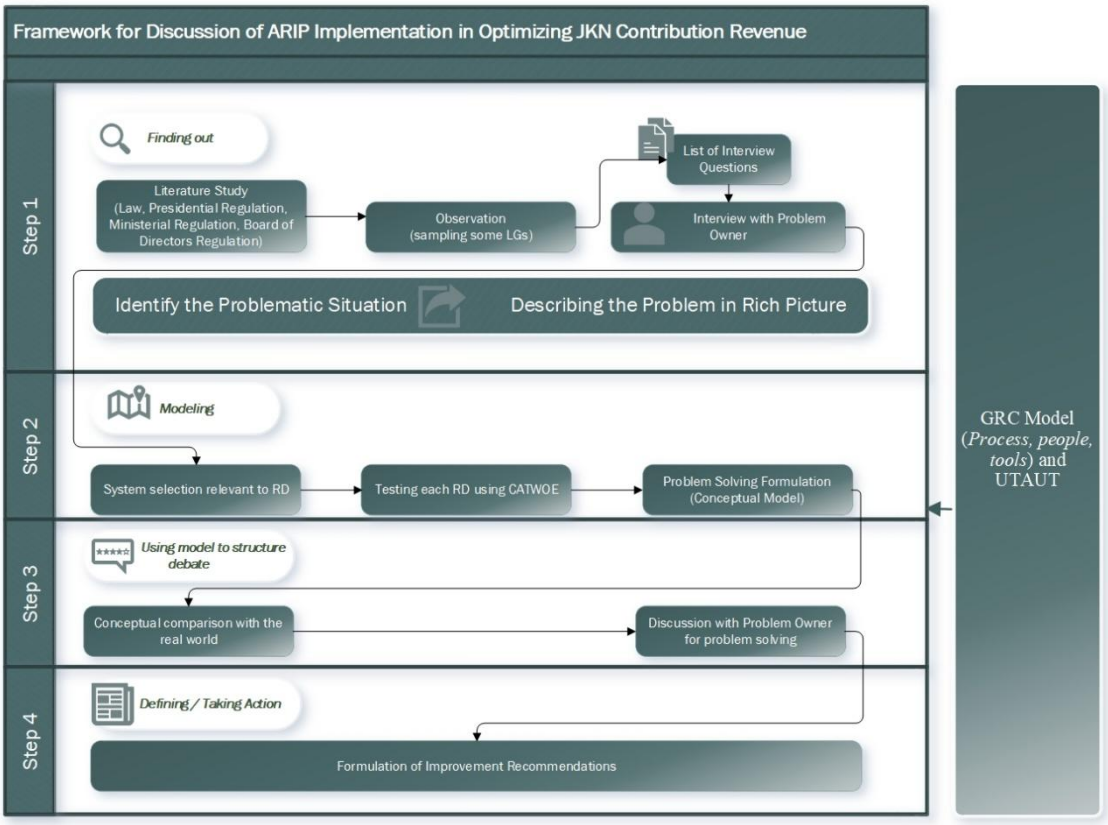

Figure 1. Framework for Discussion of ARIP Implementation in Optimizing JKN Contribution Revenue

Source: Checkland dan Scholes (1990), processed

This research is a qualitative research with a case study approach, that relies on triangulation techniques as a data validity strategy, to gain an in-depth understanding of the implementation of ARIP in the context of regional government contribution management. The triangulation technique is carried out by combining various data collection methods, namely literature study, observation, and interviews. Literature study was used to obtain secondary data from various sources such as regulations, policies, and technical documents related to JKN contributions and the implementation of the ARIP application. Observation was carried out non-participatively by attending meetings, technical guidance, and directly seeing the use of ARIP by regional government operators to assess understanding of the application. Semi-structured interviews were conducted with key stakeholders who have the authority to calculate contributions and implement ARIP, including BPKAD, Regional General Treasurer, ARIP operators, and BPJS Health officials. A total of 14 respondents were interviewed, comprising 6 individuals from regional government offices and 8 personnel from BPJS Kesehatan. The BPJS Kesehatan participants included the Director of Finance and Investment, Deputy Director, Assistant Deputy, Primary Contribution Management Analyst, and representatives from the BPJS Kesehatan branch office. The interviews were designed based on the Governance, Risk, and Compliance (GRC) excellence model and the Unified Theory of Acceptance and Use of Technology (UTAUT) to ensure the questions' relevance. This approach enabled the exploration of organizational governance, risk management, and compliance aspects, alongside user acceptance factors

such as performance expectancy, effort expectancy, social influence, and facilitating conditions. Consequently, the interview instrument comprehensively captured both institutional and user behavior dimensions impacting the implementation of the Regional Government Contribution Reconciliation Application.

The interview protocol employed in this study consisted of semi-structured interviews with key informants directly involved in the management of JKN contributions and the implementation of the ARIP system. Interviews were conducted either face-to-face or via virtual platforms, contingent upon mutual agreement, with audio recording undertaken only after obtaining informed consent from participants. The interview guide was developed to elicit detailed insights into informants' experiences, perceptions, and challenges associated with ARIP usage. Subsequent to data collection, all interviews were transcribed verbatim and subjected to thematic analysis. To enhance the credibility and validity of the findings, member checking was performed by allowing participants to review and verify the transcribed data. Ethical protocols were strictly observed, ensuring the confidentiality of respondents and their voluntary participation, with the option to withdraw from the study at any stage without penalty. Data analysis was carried out through a process of data reduction, data presentation, and conclusion drawing based on the research objectives. The results of this analysis form the basis for formulating strategic recommendations for optimizing the implementation of ARIP in increasing revenue from Health Insurance contributions.

This approach is chosen to explore participants' lived experiences, perceptions, and contextual realities, which are essential for understanding complex systemic issues. While models such as UTAUT provide a useful structure for evaluating technology adoption, the qualitative method is more appropriate in this case for uncovering the nuanced and socially constructed barriers to ARIP implementation.

RESULT AND DISCUSSION

A. Identification of Problematic Situations in the implementation of the Regional Government Contribution Reconciliation Application

Referring to the research stages in the soft systems methodology, the first stage is the finding out stage. In this stage, what is done is to identify the problem situation. To enter the problematic situation, document review and depth interviews with related parties are conducted. After that, recognizing the problematic situation, compiling a rich picture, and selecting significant problems based on the GRC excellence model and the Unified Theory of Acceptance and Use of Technology (UTAUT) theory.

1. Problematic Situation Identification

To identify problematic situations, document analysis and observation methods are used, then interviews are conducted to confirm the answers to what has been obtained during document analysis and observation. Interviews were conducted selectively with resource persons who had concerns in the implementation of the ARIP application in the context of optimizing JKN contribution revenue by paying attention to intervention, social and political analysis with the following results:

a) There is no commitment from the regional government in using ARIP;
   The lack of commitment from Regional Governments (Pemda) in utilizing the Regional Government Contribution Reconciliation Application (ARIP) constitutes a fundamental barrier to the optimal management of National Health Insurance (JKN) contributions for

both civil servant (ASN) and non-civil servant participants. Such commitment should be demonstrated through supportive policies, including circular letters, directives from regional leadership, or internal regulations that mandate the use of ARIP as the standard system for contribution reconciliation processes. However, in practice, many regional governments have yet to accord sufficient attention to the importance of this application, often due to limited understanding of its benefits or the existence of alternative systems that have been locally adopted earlier.

A statement was expressed by the Deputy Assistant for Management as follows:

"…The main obstacle is undoubtedly the commitment of the Regional Governments, as they perceive a duplication of processes. This duplication requires additional effort from the regional governments, even though, in reality, ARIP is quite simple and straightforward since it only requires uploading the PNBA (Participant Name and Address) data for all civil servant contributors across the regions."

b) Regional governments already have their own applications for calculating contributions;
Some Regional Governments have developed their own applications to calculate JKN contributions for PPU participants, which are sometimes better tailored to their local needs. However, reliance on these proprietary systems creates integration challenges with ARIP, as each system operates independently. This situation compels operators to perform duplicate data entry, both in the regional government's internal application and in ARIP. This issue was highlighted by the Deputy Director for Contribution Management in an interview:

"The current condition involves multiple payroll applications, including some developed by the Regional Governments themselves. Therefore, the regional governments face the burden of managing applications such as Taspen, ARIP, and potentially their own systems. This dualism presents a significant challenge. We hope that in the future, the Ministry of Finance or the Ministry of Home Affairs will provide a unified application that consolidates all needs, including those related to Taspen, BPJS Kesehatan, and Regional Governments…"

c) Inadequate operator competence, especially those who are elderly;
Technical competence of operators at the Regional Government level, particularly those who are older, presents a significant challenge in the utilization of the ARIP application. Operators who are not accustomed to technology or lack adequate digital skills often experience difficulties in operating ARIP, which is a web-based system requiring certain technological understanding. This situation negatively impacts system efficiency, as operators struggle to upload data, perform reconciliations, or verify the contributions to be paid. This issue was emphasized by an analyst in contribution management during an interview:

"We found that operator competencies vary across Regional Governments. Some operators, to be candid, are of an older generation, meaning they are not from the same generation as us. This creates difficulties for them in understanding the use of Excel, especially since ARIP collects data using Excel. Thus, factors such as age and employee proficiency with Excel sometimes become problematic at the Regional Government level."

d) There is no reward or punishment for those who do not use the ARIP application;
Currently, there is no established incentive (reward) or sanction (punishment) system in place to ensure the proper and timely use of the ARIP application. Without reinforcement through reward and punishment policies, many Regional Governments or government agencies do not feel obligated to maximize their use of ARIP. This situation results in a

lack of awareness and commitment to optimal utilization of the application. This issue was highlighted by a contribution management analyst at BPJS Kesehatan:
"In terms of punishment, there are currently no concrete sanctions imposed by BPJS Kesehatan on the Regional Governments. BPJS Kesehatan branch offices strive to communicate in accordance with regulations, such as requirements for complete components and accurate calculations. However, from the perspective of sanctions, there is none implemented so far. That is what we can convey."

e) There is no integration with the payroll system in the Regional Government;
The payroll systems within many Regional Governments largely operate independently from the ARIP application, resulting in the need for manual data entry into ARIP to calculate JKN contributions. This lack of integration between the payroll systems and ARIP leads to data not being updated automatically, increasing the risk of errors in contribution calculations and delays in data uploads. This issue was illustrated by the Regional Government of Purworejo Regency as follows:
"Actually, there is no formal directive from the Ministry of Home Affairs, Sir. However, there is Presidential Regulation No. 75 of 2019, if I am not mistaken, regarding the mechanism for contribution calculation. There was also a letter from BPJS concerning the use of the ARIP application, but that was issued quite some time ago."

f) Salary data in ARIP is not integrated with the membership database system
Currently, salary data in ARIP is not directly integrated with the membership database system, resulting in inefficiencies in contribution data management. The misalignment between salary records and participant data complicates the process of verifying whether the contributions paid are accurate and appropriate to the participant's status and category within the JKN scheme. This misalignment poses a risk of discrepancies between recorded contributions and the entitlements of the respective participants. This issue was highlighted by the Deputy Director for Contribution Management:
"Hopefully, ARIP can also become a tool to enhance the accuracy of participant data. Recently, we received a positive response from the Deputy for Membership Affairs, and going forward, ARIP is expected to serve as an input mechanism to ensure that it has good governance and reliable data management, and that its data can be accurately reflected in the updated master file."

2. Rich Picture

In the finding out stage, after the problematic situation can be understood, the problem is formulated into a picture (rich picture). Hardjosoekarto (2012) emphasized that the rich picture is a tool for "expressing crucial relationships in the situation and most importantly, for providing something which could be tabled as a basis for discussion" (Checkland & Poulter, 2007) The presentation of the rich picture includes structure, process, the relationship between structure and process, and the main concern. Based on this, the presentation of the rich picture is as follows:

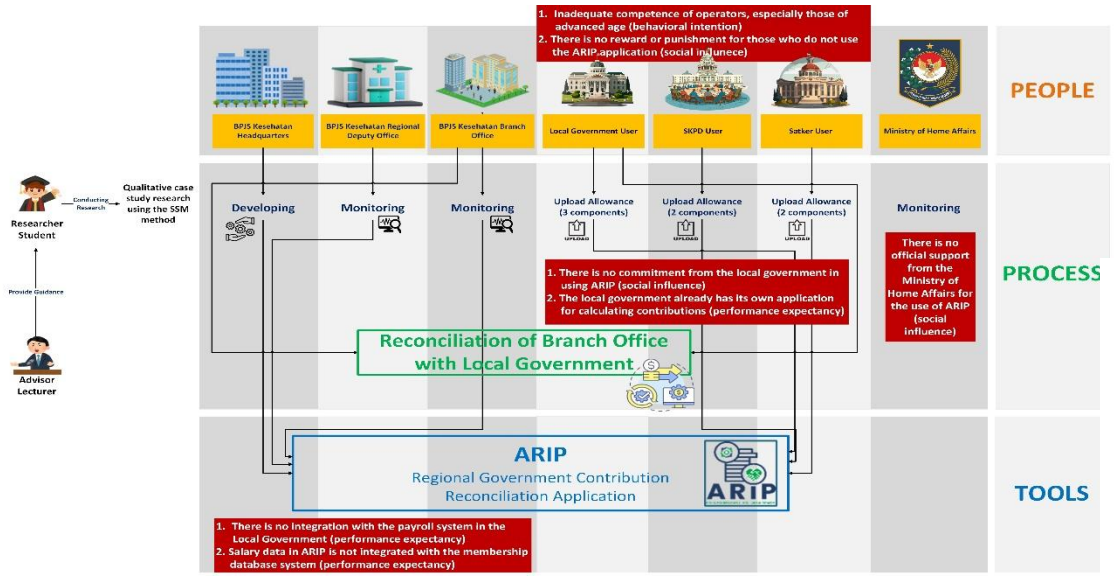

Figure 2. Rich Picture of Implementation of the Regional Government Contribution Reconciliation Application

Source: based on interviews with problem owners (processed)

Formulating a Conceptual Model (Problem Solving) for Problematics

The second stage in the modified SSM cycle is modeling, which is creating a model of a purposeful activity system. In this stage, the first thing to do is to select root definitions. A root definition describes what, how, and why, which is related to the transformation process in the organization. Root definitions are written based on the information that has been collected and discussed in the previous stage. Checkland and Poulter (2006) formulated the PQR formula in developing a root definition, which is doing P with Q to realize R. This PQR answers the questions what, how, and why.

1. Selection of Root Definitions

Identification of the source of the problem is done by tracing the causes of the problem, associated with its impact, components of the GRC excellence model, and data management issues. The process of implementing the ARIP Application to optimize JKN contribution revenue is closely related to data management of regional government employees because accurate, timely, and integrated employee data is fundamental for calculating precise contribution amounts (Jath et al., 2024). Since ARIP relies on payroll and personnel information from regional governments, any discrepancies or delays in data management directly affect the accuracy of contribution reconciliation. Efficient data management ensures that employee status, salary, and category details are correctly reflected, enabling ARIP to function effectively in optimizing contribution revenue and minimizing errors or underpayments. So that the problematic situation of implementing the ARIP Application can be related to data quality caused by hard problems (technology) and soft problems (humans) (Heeks, 2005). The relationship between the problem and the components of the GRC and UTAT excellence models can be seen in table 3. below:

Table 3. Selection of root definition based on problem situation

No	Problem Identification	Root Defintion
1.	There is no regional government commitment in using ARIP *(social influence)*	Process
2.	Regional governments already have their own applications for calculating contributions *(performance expectancy)*	
3.	Inadequate operator competence, especially those who are elderly *(behavioral intention)*	People
4.	There is no reward or punishment for those who do not use the ARIP application (*social influence*)	
5.	There is no integration with the payroll system in the regional government *(performance ecpectancy)*	Tools
6.	Salary data in ARIP is not integrated with the membership database system *(performance ecpectancy)*	

Source: based on interviews with problem owners (processed)

The analysis of ARIP implementation through the lens of the Unified Theory of Acceptance and Use of Technology (UTAUT) highlights several barriers that influence technology adoption at the regional level. First, the lack of regional government commitment in utilizing ARIP indicates a weakness in social influence, as there is insufficient pressure or support from influential entities or peers to encourage usage. Similarly, the absence of a reward or punishment mechanism for those who do not use ARIP further diminishes this social influence, reducing motivation driven by organizational expectations. Second, the fact that many regional governments already have their own applications for calculating contributions reflects a challenge in performance expectancy. Users perceive that ARIP does not offer added value compared to existing systems. This perception is reinforced by the lack of integration between ARIP and both the regional payroll systems and the national membership database, leading users to question the efficiency and effectiveness of the tool. Lastly, the issue of inadequate operator competence, particularly among elderly staff, reflects a barrier in behavioral intention. The lack of digital skills reduces confidence and willingness to use ARIP, ultimately affecting adoption and utilization. Addressing these six challenges through improvements in institutional support, technical integration, and user training is essential to ensure ARIP's effectiveness and sustainability.

Based on the results of mapping the problems in the root definition, it can be seen that of the 3 key elements in GRC, the process element is the most significant problem followed by people then tools. So that the selection of systems that are considered relevant (root definition) to improve the process of implementing the ARIP Application can be arranged based on the three components of the GRC excellence model. In accordance with the identification of problems, describing the problem (rich picture), and referring to the theoretical framework and activities of using the ARIP Application in order to optimize JKN contribution revenue, the focus of determining the root definition chosen is named with the following PQR formula:

a. RD 1: Implementation of cooperation and coordination (P) through regulations, training, and periodic socialization (Q) to increase the commitment of the Regional Government in using ARIP (R).
b. RD 2: Expansion of ARIP system integration (P) through the provision of a web-based integration platform (Q) in order to simplify the acquisition of data sources (R).

In the modified SSM cycle, in the modeling stage, after selecting root definitions, the next step is to test and finalize each root definition that has been selected with CATWOE analysis. After that, the conceptual modeling of each root definition that has been selected is done.

2. **Implementation of cooperation and coordination through regulations, training, and periodic socialization to increase the commitment of regional governments in using ARIP**.

a. Root Definition 1

Judging from the components of GRC excellence, RD 1 is an issue that is relevant to the process component (process and capability). From a governance point of view, the low commitment of the regional government in using ARIP indicates that there is no adequate policy structure and coordination between the central and regional governments. Based on the UTAUT (Unified Theory of Acceptance and Use of Technology) theory, the social influence aspect is very influential on the acceptance and use of technology, namely the extent to which individuals believe that important people (authorities or leaders) believe they should use the system. In this case, the absence of instructions from regional government leaders indicates that the perception of the importance of ARIP is not internalized in the regional government structure, so that its implementation is sporadic and unsystematic.

Criteria	Condition	Cause	Effect
Problem 1: Lack of regional government commitment in using ARIP (social influence) **Root Definition 1:** Implementation of cooperation and coordination through regulations, training, and periodic socialization to increase the commitment of REGIONAL			
Low commitment of Regional Government (Social Influence)	Regional governments do not consider ARIP as an auxiliary application, but rather as an additional burden;	There is no binding regulation for the use of ARIP and not fully understanding the benefits of using ARIP	There are no instructions from the leadership in the regional government to the BUD and Satker to use ARIP.

Table 4. Root Definition Selection Considerations 1

Source: based on interviews with problem owners (processed)

b. CATWOE Analysis of Root Definition 1

CATWOE analysis for root definition 1 is as follows:

C : BPJS Kesehatan, Regional Governments (Pemda), and JKN participants (especially from the ASN and non-ASN segments) who will benefit from improvements in the contribution management system.

A : BPJS Kesehatan (central and branches), ARIP application operators in regional governments, relevant regional government agencies (BPKAD, BKD, Technical Service), and the Ministry of Home Affairs.

T : Transformation from a manual and non-uniform dues reconciliation system to an integrated, efficient, and accountable system through the use of ARIP.

W : The use of a coordinated, transparent, and data-based digital system can improve the efficiency of JKN contribution management, build trust between institutions, and support the sustainability of the national JKN program.

O : BPJS Kesehatan as the system owner and main manager of ARIP, supported by the Ministry of Home Affairs as a policy legitimizer in the regional government environment.

E : The operator's digital literacy level, the incompatibility of regional application systems, resistance to change, the absence of a regulatory mandate from the center, and limited human resources in the regions.

c. Conceptual Model of Root Definition 1

Based on the results of interviews, theory and CATWOE analysis, this study formulates the activities that need to be carried out so that the application of the ARIP application in the context of optimizing JKN contribution revenue can be achieved, namely as follows:

All activities in Figure 3. need to be monitored by comparing them with the 3E criteria. The efficacy criterion is that the proposed activities are implemented. Efficiency criteria, namely all activities are carried out with the set budget and time target. The effectiveness criterion is that these activities can use the ARIP application in increasing and optimizing JKN contribution revenue.

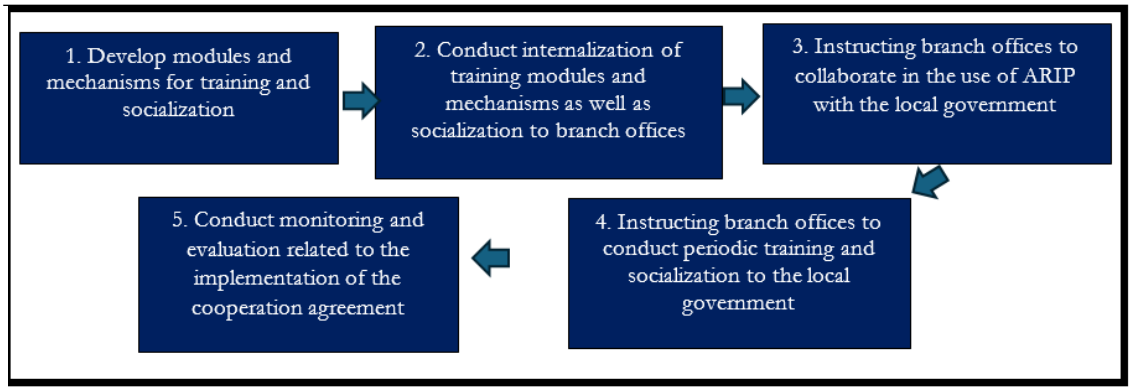

Figure 3. Conceptual Model of Implementation of cooperation and coordination with regional governments in using ARIP

Source: based on interviews with problem owners (processed)

3. Expansion of ARIP system integration through the provision of a web-based integration platform in order to simplify the acquisition of data sources

a. Root Definition 2

Judging from the components of GRC excellence, RD 2 is an issue that is relevant to the tools component (Methodology and Information Systems). In the Governance, Risk, and Compliance (GRC) framework, the tools aspect which includes methodologies and information systems is crucial to support the efficiency of business processes. According to

Racz et al. (2010), integration between strategy, process, technology, and HR is the key to ensuring the organization runs in accordance with internal policies and external regulations.

In the context of ARIP implementation, the problem of not integrating the REGIONAL GOVERNMENT payroll system with ARIP shows that the existing information system is still fragmentary, thus hindering data simplification and consolidation. Vicente and da Silva (2011) emphasize the importance of methodologies that support system integration to strengthen effective governance. Meanwhile, based on the UTAUT model (Venkatesh et al., 2012), low performance expectancy, which is the belief that using the system will improve performance, is one of the main barriers to the adoption of this technology.

Therefore, the development of a web-based integration platform as an extension of the ARIP system is an important strategy to simplify the acquisition of data sources from various payroll systems in REGIONAL GOVERNMENTs, improve user performance expectations, and strengthen governance based on integrated information systems.

Criteria	Condition	Cause	Effect
Problem 2: There is no integration with the payroll system in the regional government (performance expectancy) **Root Definition 2:** Expand the integration of the ARIP system through the provision of a web-based integration platform in order to simplify the acquisition of data sources.			
The system is not yet integrated (Performance Expectancy)	Payroll and allowance systems use different applications in each regional government with different output formats.	The existence of regional autonomy which gives regional governments the authority to regulate their own payroll systems and ARIP which stands alone because it has not been integrated with each application.	Regional governments are not willing to use ARIP because they already have other applications or do not want to do the upload process which is felt to be a repetitive process.

Table 5. Root Definition Selection Considerations 4

Source: based on interviews with problem owners (processed)

b. CATWOE Analysis of Root Definition 2

The CATWOE analysis for root definition 2 i.e. Expansion of ARIP system integration (P) through the provision of a web-based integration platform (Q) in order to simplify the acquisition of data sources (R), is as follows:

C : Regional governments, payroll system operators, and Social Health Insurance Administration Agency as beneficiaries of system integration.

A : ARIP development team, Social Health Insurance Administration Agency IT manager, and relevant regional government parties (Finance and IT).

T : Transform the stand-alone ARIP system into a web-based integrated system for simplified data acquisition.

W : Integration of payroll information systems will improve efficiency, effectiveness, and accuracy in calculating JKN contributions.

O : Social Health Insurance Administration Agency management and the central authority managing the ARIP system.

E : Regional autonomy policies, the diversity of payroll systems in each regional government, the readiness of technology in the regions, and applicable regulations.

c. Conceptual Model of Root Definition 2

Based on the results of interviews, theory and CATWOE analysis, this study formulates the activities that need to be carried out so that the application of the ARIP application in the context of optimizing JKN contribution revenue can be achieved, namely as follows:

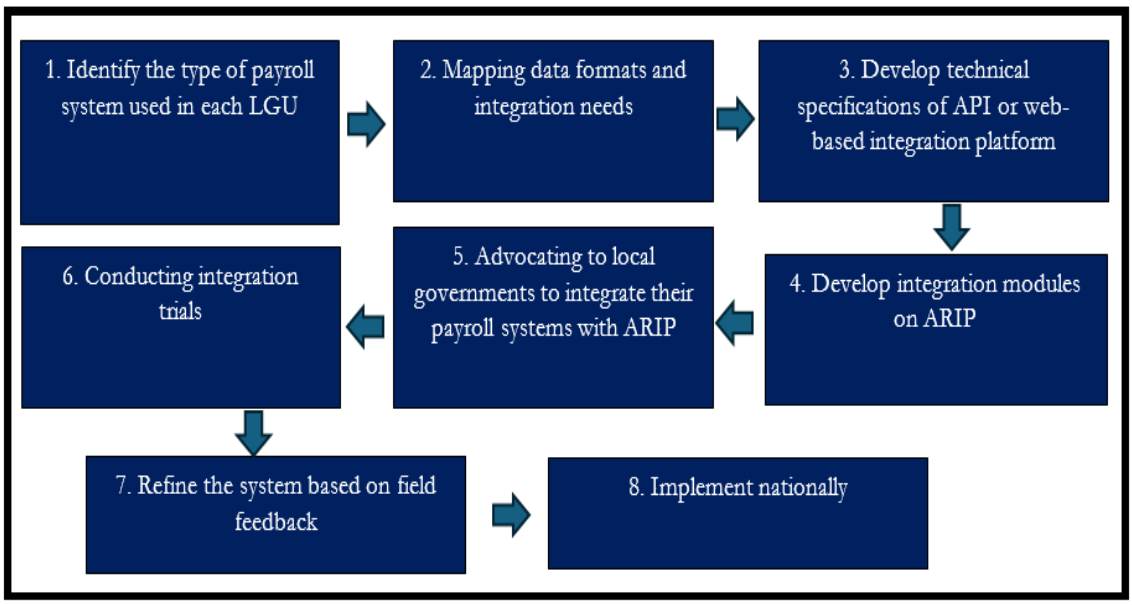

Figure 4. Conceptual Model for Expanding the Integration of the ARIP System through the Provision of a Web-Based Integration Platform in order to Simplify the Acquisition of Data Sources

Source: based on interviews with problem owners (processed)

All activities as shown in Figure 3 need to be monitored by comparing them with the 3E criteria. Efficacy criteria, namely, the expansion of ARIP system integration through a web-based platform increases the system's ability to optimally simplify the process of obtaining data sources. Efficiency criteria, namely the provision of a web-based integration platform accelerates and simplifies the data collection process, thereby reducing the time and resources required. The effectiveness criterion is that the integration of the ARIP system supported by a web-based platform increases the accuracy and completeness of the data, thus supporting more precise information-based decision making, so that the achievement of application implementation becomes more optimal.

4. Use of Conceptual Model (Problem Solving Formulation) in Discussion with Problem Owners

This section is an analysis of the third stage in the modified SSM cycle, namely the using model to structure debate stage. This stage compares the conceptual model (problem solving

formulation) created with the real world. In this stage, the problem-solving formulation in the previous stage is used as a discussion tool to discuss real-world problematic situations together with the problem owner. Interviews or discussions in this stage were conducted with problem owners from the Directorate of Finance and Investment of BPJS Kesehatan as the Coordinator of technical operational policies related to the management of contributions for all participant segments, including PPU Regional Government. Interviews were conducted to compare activities in the conceptual model with the real world. This is done to obtain more points of view to formulate action suggestions related to problematic situations, in this case related to the use of the ARIP application in the context of optimizing JKN contribution revenue. Furthermore, a comparison between the proposed activities and the real conditions can be identified to see the gaps that exist. The results of the interviews and analysis of the comparison of activities in the formulation of problem solving with real conditions are described as follows:

a. Comparison and Formulation of Root Definition 1 Recommendations

Based on the results of discussions with the Assistant Deputy for Wage Earner Participant Fee Management (Asdep MI PPU) and MI PPU Analyst, BPJS Kesehatan, as the person in charge of the ARIP application implementation process, the results of comparison and formulation of recommendations for root definition 1 are obtained, namely:

Root Definition	**Activities**	**Yes/No/ Partially**	***Real World***
Implementation of cooperation and coordination through regulations, training, and periodic socialization to increase the commitment of regional government in using ARIP.	1. Develop training and socialization modules and mechanisms	Yes	Training modules have been developed but have not been updated in the latest version. The socialization mechanism is still ad-hoc without a structured schedule.
	2. Conduct internalization of training modules and mechanisms as well as socialization to branch offices	Partially	Internalization is carried out only at 100% of branch offices, but it is not optimal because it is interspersed with routine work and the technical implementation is less structured.
	3. Instructing branch offices to collaborate in the use of ARIP with regional governments	No	Instructions given are only limited to implementation, not instructions for cooperation.
	4. Instructing branch offices to conduct periodic training and socialization to regional governments	Partially	Instructions are given but not systematically monitored. Training implementation is inconsistent and the frequency varies by region.
	5. Conduct monitoring and evaluation related to the implementation of the cooperation agreement	No	There is no structured monitoring and evaluation system to measure the success of the implementation of the cooperation agreement because cooperation with the regional government has not been implemented.

Table 6. Comparison of Root Definition 1 Conceptual Model with Real World

Source: based on interviews with problem owners (processed)

b. Comparison and Formulation of Recommendations Root Definition 2

The first activity in this RD is to identify the type of payroll system used in each REGIONAL GOVERNMENTU. This activity is very important for expanding the integration of the ARIP system, but to date, the identification of payroll and benefit systems in REGIONAL GOVERNMENTUs has not been done. This is a major obstacle because without knowing the payroll system used in each region, it is impossible to design the right integration. The following is an illustration of the comparison of the conceptual model with the real world for root definition 2:

Table 7. Comparison of Root Definition 2 Conceptual Model with Real World

Root Definition	**Activities**	**Yes/No/ Partially**	***Real World***
Expansion of ARIP system integration through the provision of a web-based integration platform in order to simplify the acquisition of data sources	Identifying the type of payroll system used in each regional government	No	There has been no identification of payroll and benefits systems in regional governments.
	Mapping data formats and integration needs	Partially	Initial mapping has been done for commonly used payroll systems, but has not yet covered specific systems developed regionally by several regional governments or centrally.
	Developing API technical specifications or web-based integration platforms	No	API technical specifications have not been developed because there is no overview of the application mapping results.
	Developing integration modules in ARIP	No	There is no integration module development yet.
	Conduct advocacy to regional governments to integrate their payroll systems with ARIP	No	There has been no advocacy because the integration system does not yet exist
	Conduct integration trials	No	There has been no trial because the integration system does not yet exist
	Improve the system based on field feedback	No	There has been no refinement because the integration system does not yet exist
	Implement nationally	No	There has been no implementation because the integration system does not yet exist

Source: based on interviews with problem owners (processed)

5. Process improvement of the implementation process of the Regional Government Contribution Reconciliation Application in optimizing JKN contribution revenue

The analysis in this section is the last stage in the modified SSM cycle, namely the defining/taking action stage. Based on the views through discussions with the problem owner at the BPJS Health Finance and Investment Directorate at the previous stage, at this stage, follow-up suggestions are formulated for improving the process of using the ARIP

Application in the context of optimizing JKN contribution revenue. Based on the results of the discussion of the conceptual model of the entire root definition, there are several activities that have been changed and improved.

First, in Root Definition 1, the activity concerning instructing BPJS branch offices to collaborate with local governments in using ARIP requires enhancement. Currently, these directives are limited to technical guidance and lack formal policy mandates that promote structured collaboration. As such, regional governments may not feel institutionally bound to use ARIP. It is recommended that BPJS branch instructions incorporate policy-based mechanisms that initiate legal and administrative frameworks for cooperation agreements. Research by Venkatesh et al. (2003) suggests that social influence and facilitating conditions significantly affect technology acceptance, especially in institutional settings. Formal cooperation policies can thus function as enabling conditions under the Unified Theory of Acceptance and Use of Technology (UTAUT), reinforcing regional governments' commitment.

Second, for Root Definition 2, the recommendation is to initiate development of the integration module immediately upon finalization of technical specifications. This module must account for the heterogeneity of payroll and administrative data systems used across local governments. Effective integration also requires rigorous testing and quality assurance to prevent interoperability failures—one of the key performance expectancy indicators under UTAUT (Venkatesh et al., 2012).

Although ARIP has already contributed to an average annual increase in contribution revenue of approximately IDR 1.071 trillion, findings show an unrealized potential of IDR 420 billion per year. Thus, the application could yield up to IDR 1.49 trillion annually if implemented comprehensively. This aligns with statements from the BPJS Director of Finance and Investment, who emphasized that ARIP is critical to unlocking regional revenue potential and improving JKN's fiscal sustainability.

These findings support and expand on prior research. For instance, Firdaus and Wondabio (2019) analyzed health contribution burdens in the context of the JKN program, highlighting inefficiencies in contribution tracking. However, their work did not explore the application of digital reconciliation systems. This study contributes a more action-oriented approach by integrating ARIP as a digital enabler. Similarly, Fajrini et al. (2021) investigated non-compliance in BPJS payments among non-subsidized members but focused on individual behavior rather than institutional systems. Unlike those studies, this research applies UTAUT not only to measure user attitudes but also to assess organizational readiness, technical support, and system integration challenges—factors largely absent in earlier literature.

The integration of UTAUT with Governance, Risk, and Compliance (GRC) principles further strengthens the study's analytical depth. From a governance perspective, formal collaboration agreements enhance accountability; from a risk angle, data inconsistency and double entry risks can be mitigated through integration; and from a compliance dimension, aligning ARIP implementation with regulatory frameworks ensures legal conformity. In sum, this study provides both theoretical and practical contributions: theoretically by applying UTAUT-GRC in a public sector digital application context, and practically by offering implementable improvements that could significantly increase JKN revenue through better reconciliation mechanisms.

This is in line with the expectations of the Director of Finance and Investment (Dirkeuin) Social Health Insurance Administration Agency in interviews conducted by researchers, that

the hope when the application can be fully implemented by the Regional Government, can increase JKN contribution revenue. Dirkeuin's statement is as follows:

> "ARIP is a Regional Government contribution reconciliation application, meaning that it is clear that this application is an auxiliary application to ensure that we receive contributions because it is very important for the financial system of the JKN contribution program to benefit all Indonesian people. So that our position as Director of Finance is to optimize existing potentials, one of which is through contributions from civil servants, especially regional government civil servants. So that this application is very important and it has been proven that it can be seen later from the data, how many recipients of contributions before this application is used and how many contributions after this ARIP application is used ".

CONCLUSION

This study reveals that the successful optimization of JKN contribution revenue through the Regional Government Contribution Reconciliation Application is predominantly driven by three critical factors: process efficiency, human resource competence, and technological tools. Despite the observed increase of Rp1,070 billion in contributions from regional civil servants following ARIP implementation, full utilization remains unrealized. The research highlights that unleveraged potential could raise contribution revenue by as much as Rp1,490 billion annually if ARIP is optimally adopted across all regional governments. This finding underscores the transformative role of integrated information systems in enhancing revenue accuracy and organizational goal attainment within public health insurance schemes.

The study underscores the necessity for targeted interventions in improving operator competencies and fostering stronger institutional commitment at the regional government level. Furthermore, it emphasizes the critical role of regulatory frameworks in mandating the use of information technology systems such as ARIP, which is essential for harmonizing data management and ensuring consistent application across regions. For policymakers and Social Health Insurance Administration Agency, the evidence supports prioritizing continuous training programs and proactive advocacy efforts to institutionalize ARIP usage. Accelerating web-based system integration also emerges as a key factor to reduce manual processes and improve data reliability, ultimately facilitating more accurate revenue collection.

This research is constrained by limited access to comprehensive data on the operational challenges experienced by regional governments, which may have led to an underestimation of contextual factors influencing ARIP adoption. Additionally, the current study does not quantitatively assess the longitudinal impact of regulatory changes or fully explore variations in technological infrastructure across different regions, potentially affecting the generalizability of the findings. Furthermore, the study focuses primarily on regional civil servant contributions, leaving out other contributor groups within the JKN framework.

Future studies should conduct longitudinal evaluations to assess the sustained impact of ARIP optimization on JKN revenue over time, incorporating diverse regional contexts and broader stakeholder perspectives. Research exploring the socio-political dynamics affecting regional government commitment and operator motivation would deepen understanding of adoption barriers. Moreover, investigating the cost-benefit analysis of full ARIP integration and the role of advanced IT solutions like AI-driven analytics could provide actionable insights for enhancing system efficiency. Finally, expanding research to include other contributor categories would offer a more comprehensive picture of the system's overall performance in optimizing JKN contributions.

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