

Improvement of Business Process Modeling in Internal Audit Planning at an Indonesian State-Owned Enterprise

Novan Bastian Dwi Ardha^{a*}, Nur Indah Riwijanti^b, and Zainal Abdul Haris^c

^a *Department of Management Accounting, Politeknik Negeri Malang, bastian.novan@gmail.com, Indonesia*

^b *Department of Management Accounting, Politeknik Negeri Malang, nur.indah@polinema.ac.id, Indonesia*

^c *Department of Management Accounting, Politeknik Negeri Malang, zainal.abdul@polinema.ac.id, Indonesia*

Abstract. The previous research reported that there were gaps between the procedure of internal auditing at an Indonesian state-owned enterprise namely J Corp with the standard set by the International Association of Internal Auditors. To harmonize the company's procedure with the international standard for professional practice of internal auditing, this study analyzes the current business process of internal audit planning activity and proposes the to-be business process modeling. Special attention is given to the need for internal auditors as the key users of this activity to make improvements and adjustments to the future business process model. This study applied a qualitative approach by conducting focus group discussions with the internal auditors, reviewing the standard operating procedure of internal auditing, and observing the walkthrough of internal audit planning that has been done by internal auditors. By using Business Process Modeling and Notation, this study will draw graphical notation to depict steps in the business process of a company's internal audit planning. Business Process Modeling and Notation is used to draw current business process of internal audit planning and it will be compared to standard of business process in internal audit practice. The gaps between as-is business process and the standard are discussed with the internal auditors to describe any improvements that should be made and the to-be business process will be depicted once again using Business Process Modeling and Notation. The result of the study is immediately beneficial for the internal audit function at the J Corp to improve their standard operating procedure by conforming to the international standard and also enriches the literature for practitioners to know how to improve the business process in the internal audit planning.

Keywords: business process modeling, improvement, internal audit planning, Business Process Modeling and Notation

*Corresponding author. E-mail: bastian.novan@gmail.com,

Introduction

The Internal Audit Unit of J Corp, an Indonesian state-owned enterprise had received a report from the external assessor regarding its quality assessment in the company's internal audit capability for the year 2021. The report shows that the Internal Audit Unit of J Corp is having less performance in their audit planning activity due to several activities are not conform with the international standard for professional internal auditing.

First, the internal auditors of the company did not assess the corporation's risk matrix as the source of their annual audit plan. The assessment of a corporation's risk profile is highly required by the standard. The Institute of Internal Auditors (2016) stated that the Chief Audit Executive must establish a risk-based plan to determine the priorities of the internal audit activity, and align to the organization's objective. By paying attention to the highest risk of the company, the internal auditors could manage their resources to deliver audit and consulting services to support management in achieving the company's top goals. Further, it is also supported by Anderson et al. (2017) stated that planning the engagements involves obtaining an understanding of the auditee including business objectives and the risks that threaten the achievement of those objectives.

Previous studies indicated that a risk-based internal audit is considered an important step for auditor to perform their services. Heldifanny & Tobing (2018) argued that the internal audit unit of an Indonesian public university should prioritize some risks correlating to rapid changes in technology. The university should adjust its teaching and learning approaches so that the skills of graduates are relevant to the current environment. Erlina et al. (2020) stated that the application of risk-based internal audits has a significant effect on the quality of internal audits in the government of North Sumatra Province in Indonesia. Another study from Nyarombe et al. (2015) also indicated that the implementation of risk-based internal audits positively affected the improvement of internal control systems in government departments in Uasin Gishu of Kenya.

Second, the internal auditors of J Corp did not develop and document their audit plan in the proper working papers. It causes lacks in some circumstances such as the junior auditors did not know how they should perform in each engagement

as there is no available documented audit work from prior years. They do not have a clue how to start their work as there is no guidance to refer to. Unavailability of audit plan's working papers also causes the current internal auditors do not having knowledge on how they evaluate the preceding engagements and make improvement for current engagements. It is surely contrary to the standard that requires the internal auditors for having to develop and document work programs that achieve the engagement objectives (The Institute of Internal Auditors, 2016).

Third, the lack of working papers for audit planning also leads to the weak process of quality control from the internal audit team. There is no activity of peer review amongst the internal audit team that should be documented during their internal audit planning. This supervision activity also requires the standard to ensure that the audit engagement's objectives are achieved, quality is assured, and the junior auditors are developed (The Institute of Internal Auditors, 2016).

Those three gaps were found in the report of the external assessor regarding the quality evaluation of internal audit activity in J Corp. Ardha et al. (2023) also reported that those gaps were caused by six key points that has been discovered by the fishbone diagram which coming from the company namely 6Ps including Policy, Process, People, Plant, Program, and Product. During the interviews with the internal auditors of the company, it was discovered that the lack of performance of internal auditors is caused by the standard operating procedure for internal auditing (SOP) of the company. There is no obligation in the SOP of the company that requires the internal auditors to perform an assessment on the corporation's risk profile, document their audit planning, and review their internal audit member's performance during the engagement.

Manghani (2011) explained that the SOPs is simply described as written instructions that specify who does what and when, or the way to do an activity or a process. As a part of the quality system, the SOPs should ensure that appropriate processes are implemented to fully satisfy customer needs and expectations and the company's goals. However, there is a concern in this research on how to ensure that the J Corp has an appropriate process in their SOP of internal auditing.

A method to ensure that company's SOP of internal auditing is high quality to perform is to compare the company's SOP with the international standard of professional internal auditing. Weske

(2007) explained that once business processes are defined, they can be subject to make improvement. Hence the business process that has been written on the company's SOP will be compared to the standards. The comparison of as-is business model and to-be business model will be depicted with the modelling language namely Business Process Modelling and Notation (BPMN). BPMN is chosen as there are several studies explained that BPMN provides a notation that is easily understandable by all business users both business analyst and technical developers for implementing technology that will perform those processes (Birkmeier et al., 2010; Carnaghan, 2006; Michalik et al., 2013; Wohed et al., 2006). By drawing a business model notation with BPMN, it will be known on the as-is business process model that reflects current SOP. Then this research will propose the to-be business process model regarding the company's SOP that has been harmonized with the standard of internal auditing and the needs of internal auditors.

Research Method

This research was using the business process improvement (BPI) method. This method refers to the process-based change concept. Adesola & Baines (2005) presents a generic model for business process improvement that begins with steps to understand business needs, understand the process, model and analyze the process, redesign the process, implement a new process, assess new process and methodology, and review the process. However, due to the limitation of the resource, this study is limited to finalizing the step in the redesign process. The table below describes the steps and techniques of this study.

Table 1
BPI Step Activities and Techniques for Improving Internal Audit Planning

Step Name	Step Description	Techniques
1. Understand Business Process 2. of Audit Planning	Analyse business strategy and primary risk of the company. Identify the as-is business process of internal audit planning. Capture the role during a business process.	Focus group discussion with key users/internal auditors. Review SOPs of internal auditing. Walkthrough. Review the organization structure.
3. Model As-Is Business Process	Model business process.	Brainstorming.

Step Name	Step Description	Techniques
	Verify and validate the model.	
4. Compare As-Is Business Process with The Standards	Identify criterion on the standard. Identify key users' needs and resources.	Focus group discussion with key users/internal auditors. Review the standards of professional internal auditing. Review the report from external assessor.
5. Model To-Be Business Process	Model business process. Verify and validate the model.	Brainstorming. Walkthrough.

This study highly involved the internal auditors of J Corp who are valued as the key users of the business process model of internal audit planning. This strong collaboration was represented by the techniques for collecting data and information, including focus group discussion and brainstorming. Internal auditors are highly valuable for making this study happen as they are business process owners and have a routine activity with this process. Their understanding of what they do during the annual internal audit plan and the SOPs of the company is the key role in this study. Hence, the objective of the discussion with them was to collect qualitative information about the as-is business process model and to-be business process model in the internal audit planning.

The J Corp's Internal Audit Unit comprises a Chief Internal Audit (CAE), two senior auditors, a junior auditor, and a secretary. During this study, the CAE and internal auditors were involved in the brainstorming process and focus group discussion as business process actors. The profile of the participants are as follows: the CAE is a senior employee in the company. He holds master degree in water resource management and has been assigned in across functional business units including operational division in an Indonesia's river basin, corporate secretary that deal with home and external affairs, and division of budgeting and planning. His experiences in difference assignments will enrich the discussion. Meanwhile, the senior auditors are also employees who have years of work more than ten years. Both of them hold college degree in civil engineering and has long experience in operational division at two difference Indonesia's river basins. Their experience in facing dynamic business process in both river basins' management will be beneficial

to understand on how they do audit process in this company. The last member of audit team is junior auditor who has educational background in accounting. He has been excluded from the participants of the focus group discussion as he is initiating to make this study and also conducting this research. He acts to clear the path of discussion among the participants and researchers by defining participants' response and keywords hence the researchers could draw meaningful insights.

There is also a step to review the company's SOP of internal auditing which is Quality Procedure Number 14 (QP/PJT/14) version R9 that has been last revised on October, 15th 2021. This SOP of internal auditing will be compared with the International Standard for the Professional Practice of Internal Auditing (the Standards) published by the Institute of Internal Auditors. The standards are principle-focused to provide a framework for performing and promoting internal auditing. These principle-based standards make the organization conform to the requirements of this procedure with its unique business process and the nature of complexity.

Results and Discussion

In this section, the results of business process improvement steps are presented. It is highly recommended to understand the nature of an entity which will be a guidance throughout the research.

Understand the Business Process of Audit Planning

J Corp is an Indonesian state-owned enterprise that is given a mandate by the Indonesian government to manage water resources in five river basins in Indonesia. There is only another company in Indonesia which has the same task like J Corp to manage water resources. It makes the J Corp has a unique business process model in comparison to the other Indonesian state-owned enterprises.

The business process of J Corp which manages water resources in Indonesia also brings complex risks for the company. The risk management function of J Corp namely the Division of Risk Management and Performance (DRMP) is having a task to periodically assess and report the company's risk profile to the boards. From the monthly risk management report, it is discovered the company's top risks that produced by DRMP.

After having an understanding of the company's top risk profile, it has been conducted a focus group discussion with the internal auditors of the company. This discussion is primary focused on their daily activity on how they perform internal audit planning. The discussion was held under the topic of the content of the QP/PJT/14 regarding audit planning specifically on how they perceive this SOP and implement it in their activity. This study also reviewed the result of their implementation of QP/PJT/14 by doing a walkthrough of audit documentation.

QP/PJT/14 requires internal auditors of J Corp to consider information from annual work plan and budget, company's risk profile, and organization structure throughout they perform audit planning. This step of risk assessment is also recommended by The Institute of Internal Auditors (2020) in the internal audit plan development cycle. The internal auditors explained that they have been considering the company's risk profile during their work on planning of annual internal audit program. This compulsory step to collect and analyze the company's top risk matrix is also stated on the QP/PJT/14 although there is no requirement on this SOP to document this process. This lack of obligation to document the process in the SOP means there is no documentation could be gathered from internal auditors regarding their work. The lack of documentation and working papers from internal auditors reflects that there is no quality control from the company's SOP to demand the auditors to document their works.

Furthermore, after getting the annual internal audit plan for the year 2021, it was found that the internal auditors entered almost all divisions in the company to this paper. It means that the internal auditors performed assurance service for almost all business processes in the company including where there is found an identified low risk on this process. It reflects that the internal auditors did not assess the company's risk profile even though they had this report. The internal auditors respond to this discussion with the awareness that their understanding of risk assessment and management needs to improve by joining a comprehensive training or short course.

The lack of documentation of audit planning in the assessment of risk profile leads to the unavailability of the review process in the internal audit planning. QP/PJT/14 does not require the internal auditors especially for the CAE and senior auditors to review the performance of junior auditors during the

assurance and consulting engagements. The internal auditors realize that there is a lack of supervision process between the internal audit members as there is no obligation to do so in the QP/PJT/14. This less of supervision during assurance engagement including in the step of planning could affect the adequacy of control procedures that should be done by auditors. In addition, it will lead to the conclusion from Aobdia et al. (2020) that the fewer control procedures of auditors cause them to fail to report material weaknesses in the organization’s internal controls. Consequently, it surely will make the internal audit function of J Corp less effective in supporting top management to achieve its strategic goals.

Model As-Is Business Process

Figure 1 depicts the as-is business process model of internal audit planning in the J Corp. This model reflects QP/PJT/14 version R9 which was updated on October, 15th 2021. This model was drawn with BPMN supported by Bizagi Modeler.

(3) Assigned Directors, (4) Supervisory Board, (5) Affected/Auditable Units.

Main activities on this business process notation is in the Internal Audit Function where there are several activities that should be prepared and completed by auditors.

As shown in Figure 1, it could be described that the beginning of this phase is started when the internal auditor enters the company’s risk profile, annual work plan and budget, and organization structure before they develop the annual internal audit program. After that, the CAE will send the annual internal audit program to the President Director for his review and approval. If there is any review from the President Director, the internal auditors should follow up on the notes and send it back to the President Director. This process will finish until this document is fully agreed and signed. The signed annual internal audit program from the President Director will be sent to the board of directors, the board of commissioners, and the affected division during a year of engagement.

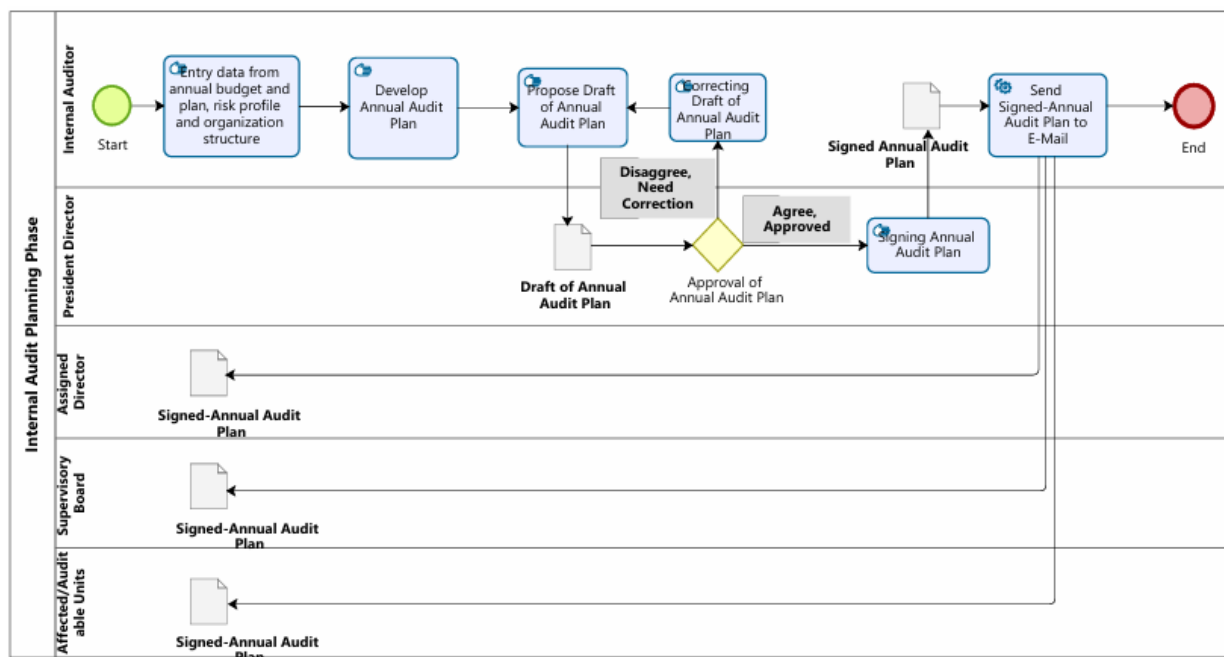


Fig 1. As-Is Business Process of Internal Audit Planning

There are five lanes of related function who involved in the internal audit planning phase at the company. Those five units including (1) Internal Audit Function which comprises of internal auditors and Chief Audit Executive, (2) President Director,

Compare As-Is Business Process with the Standards

The as-is business process model above subsequently was compared with the standards. The step of assessment has been held by making focus group discussion with the key users which is the

internal auditors of the J Corp. The discussion was held by proposing a matrix of question that has been adjusted with the criterion of internal audit planning in the standards. Each answer from the internal auditors will be described and concluded whether they have complied with the standards or there are found gaps that could be improved in their business process of internal audit planning.

The result of the focus group discussion with the internal auditors of J Corp is shown below.

Table 2
The Result of Focus Group Discussion with the J Corp's Internal Audit Team

Criteria	Statement	Answer and Description
Internal audit plan is developed based on the priority concerns from board of directors, board of commissioner and other stakeholders.	<ol style="list-style-type: none"> Internal auditor unit has audit universe. Audit universe describes auditable units that could be represented by division, activity, project, program, policy etc. Audit universe has paid attention whether those auditable units support company's strategic goals; whether those auditable units have material impacts; whether those auditable units manage significant amount of fund. 	<ol style="list-style-type: none"> No. There is no available working paper that analyze audit universe and assessment of risk profile that could be gathered from DRMP as the risk management function. No. There is no available documentation to analyze audit universe that paid attention to the auditable units.
	There is any documentation from auditors to capture the results of their consulting process with the board of directors, board of commissioners, or any other	Yes. There is documentation of the consulting process with the President Director regarding the concept of an annual internal audit program. This process has been written down in the minutes of the

Criteria	Statement	Answer and Description
	stakeholders to determine the audit timetable.	meeting. However, there is no involvement of such a process with the board of commissioner.
	There is any identification of audit engagements, including the audit cycle to entry in the annual internal audit program	No. There is not available working papers to document the process for developing annual internal audit program that describe identification process of audit engagements.
	There is any identification of types, objectives, scope of assurance, and consulting services.	No. There is not available working papers to document such identification in the process of developing annual internal audit plan.
	The process of development annual internal audit plan has been including calculation of resources to achieve assurance and consulting objectives, and any additional resources that will be needed to fulfil the concerns of board directors, board commissioner, or other stakeholders that might be rising up during the period of audit program.	Yes. The 2021's annual internal audit program has stated the number of auditors to perform assurance and consulting services during defined audit timetable. However, there is no working paper to capture information how the internal auditors come up with this number, there is no any process to determine those resources or any justification during the process of allocation. It is also no available documentation that this calculation has been reviewed by CAE, the President Director, and members of the board commissioner.
	The process of developing an annual internal audit program has combined the required competencies of	No. The 2021 annual internal audit program just only stated that the assurance and consulting service for that year has

Criteria	Statement	Answer and Description
	human capital including from the internal auditors themselves or co-sourcing and outsourcing from external parties.	been conducted by internal auditors of J Corp. There is no documentation to capture any information and adjustments that describe those decisions.
	The annual internal audit program has been approved and signed by the board of directors and the board of commissioners.	Yes. The 2021's annual internal audit program has been signed by the President Director. However, there is no process of consulting and approval for this paper from the board of commissioners including from the Audit and GCG Committee.
There is availability of a risk-based audit plan.	There is a result of consulting process with the board of directors and board of commissioners to understand their points of views regarding the company's risks and environment.	Yes. There is a minute of meeting with the President Director while discussing the concept of annual internal audit planning of 2021. However, there is no such process with the board of commissioner.
	There is a documentation that analyze the framework of risk management in the company.	No. There is not presence of working papers to analyse audit universe that state the reliability of risk assessment from risk management function in J Corp.
	There is documentation of review process in the alignment of the annual internal assurance and consulting program with the company's strategic goals.	No. There is no presence of working papers to document this process.
	There is documentation the results on: 1. Audit Universe's updating process	No. The internal auditors realize that: 1. The 2021 annual internal audit program was developed at

Criteria	Statement	Answer and Description
	2. Identification of high risks auditable units 3. Probability determination of whether identified risks will significantly impact the achievement of the company's goals 4. Identification of risk responses and mitigations 5. Identification of additional risk responses and mitigations. 6. Assessment of fraud indication	once at the end of the year 2020 without any revision from the internal auditor to determine any updated information on the audit universe. 2. The 2021 annual internal audit program was comprised all division of company. There was not calculation of its risk level. 3. There is not presence of working paper to describe analysis of risk profile. 4. There is not presence of working paper to describe analysis of risk profile. 5. There is not presence of working paper to describe analysis of risk profile. 6. There is not presence of working paper to describe analysis of risk profile.
	There is approval from President Director for the annual internal audit plan	Yes. The 2021's annual internal audit program was approved and signed by President Director.
	1. There is documentation of the review and adjustment of the annual internal audit plan as a response to the changes in business process, risk, operational,	No. There is not available of working paper to review and adjust the 2021's annual internal audit program and its explanation.

Criteria	Statement	Answer and Description
	<p>program, system, and control.</p> <p>2. If there is no such adjustment, interview with the board of directors to ensure that there are no significant changes on those items.</p>	

From the result of the focus group discussion above, it could be concluded that there are gaps between the QP/PJT/14 as the procedure to guide the internal auditors in developing an internal audit plan with the standards. It means that there is less compliance with the internal audit function in J Corp to develop risk-based audit planning. This study compiles the potential improvements in the business process of internal audit planning in J Corp, as follows:

1. There is a need for an additional role that should be involved in the business process of internal audit planning. This role is in the risk management function. DRMP as the risk management function at J Corp, should be entered into the process as they have a knowledge and report of risk profile in the company. The internal audit unit should have a strong coordination with this function as internal auditors will assess the risk management function's work to determine the audit universe.
2. There is a need of a working paper to document the analysis of internal auditors regarding audit universe, audit resources, and audit program that determine significant risks and the adequacy of internal control of the company. This requirement to document any activity of internal auditors also should be written down on the to-be business process model.
3. There is a need of a consulting process with the Audit dan Good Corporate Governance Committee as the representation of the board of commissioner regarding the annual internal audit plan that has been produced by internal auditors.

Furthermore, the internal auditors realize that they need a software or web-based application to properly document their activity including in audit planning. A senior auditor stated that their works in assurance

and consulting activities in the company is increasing simultaneously with demands from capital owners which is the government of Indonesia that represented by the Ministry of State-Owned Enterprise to strengthening the company's good corporate governance practices. It makes the internal audit function of J Corp needs an information system to manage all their works. Several studies proved that management information system supports the effectiveness of internal audit activities. Samagaio & Diogo (2022) showed that there is a positive correlation between using computer-assisted audit tools and techniques by auditors with the detection of potential fraud risks in the process of procurement. Reza, (2022) presented the Research and Development study that invented an information system for internal auditors to ease them doing assurance activity in the North Maluku Muhammadiyah University, Indonesia. Meanwhile, Špaček (2021) also provided an idea of design pattern of the software solution to business process simulation in order to capture business process risk in the organization.

Model To-Be Business Process

This model to-be business process model is based on the result of focus group discussion with the internal

risk register. This process is managed through an information management system namely Engagement Management System (EMS);
4. The internal auditor proposes the concept of

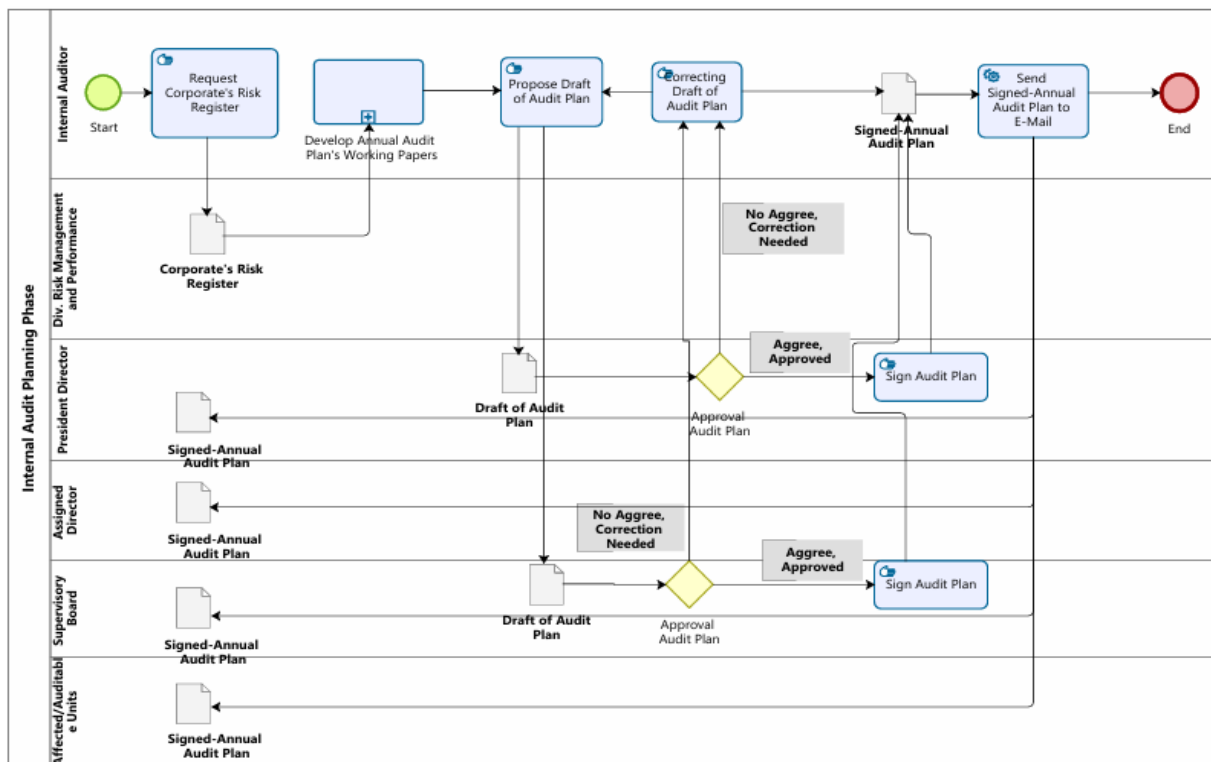


Fig. 2. To-Be Business Process of Internal Audit Plan

auditors at J Corp. The business process improvement is adopted and depicted once again in BPMN by using Bizagi Modeler. The Figure 2 represents a model of to-be business process of internal audit planning at J Corp that would be implemented.

The steps for planning an annual internal audit at J Corp as follows:

1. Internal auditors in the Internal Audit Unit request the corporate's risk register to the DMRP;
2. DMRP sends the corporate's risk register to the internal auditors;
3. Internal auditors carry out the process of preparing annual internal audit plan based on the corporate's

annual internal audit plan to the President Director and supervisory board for discussion;

5. If there are corrections, input, and changes to the concept of annual internal audit plan, internal auditors will make corrections to this paper to adapt into it as the results of discussion;
6. If there no corrections, input, and changes to the concept of annual internal audit plan from the President Director and supervisory board, then the President Director and supervisory board sign the annual internal audit plan and submit it to the internal auditors;
7. The President Director sends via electronic office a form of signed-annual internal audit plan to the board of directors, supervisory board and all affected division or business unit.

However, there is a supplementary phase of internal audit planning activities that shall be performed in the internal audit function where there are a lot of works to develop draft of annual audit plan. This Figure 3 depicts what happened in the internal audit function during constructing this data of planning.

6. They will review audit universe working papers from senior auditor. If there is any correction of this file, CAE is making notes on it and signing on it with the date of review. The next process is followed by senior auditor and junior auditor, if possible, to answer the comments of reviewer by

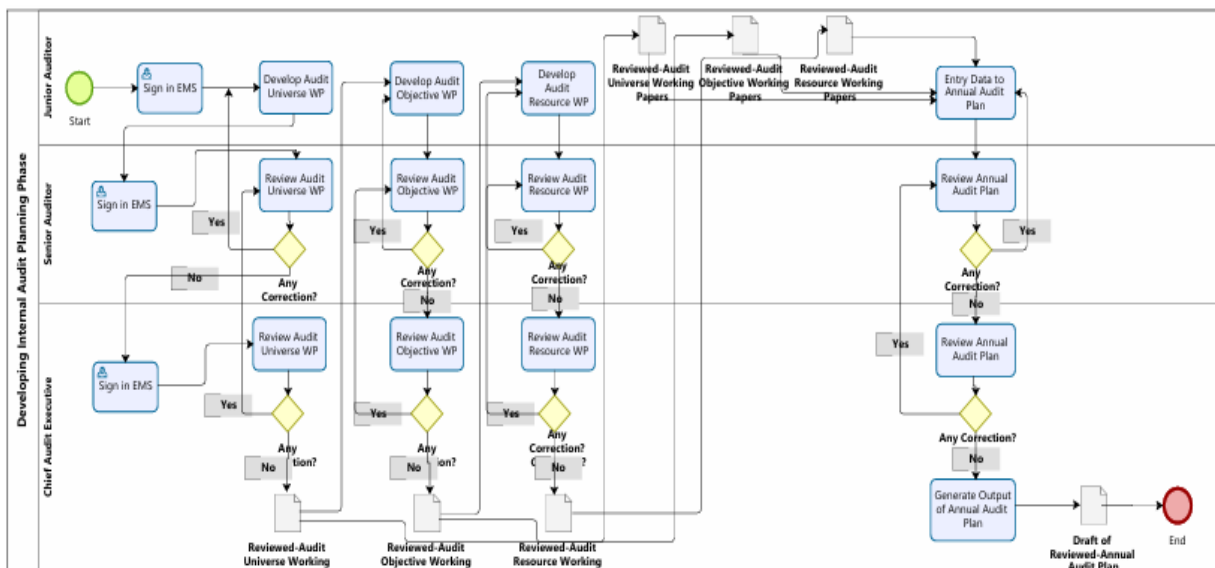


Fig. 3. Developing Draft of Audit Plan

The steps for planning an annual internal audit at J Corp as follows:

1. Junior auditor starts the work by logging in to the Engagement Management System (EMS) with the determined username and password;
2. They develop working papers to determine the audit universe based on the data from external sources. There will be working papers that supposed to be reviewed by the senior auditor;
3. Senior auditor logs in to the EMS with the determined username and password;
4. They will review audit universe working papers from junior auditor. If there is any correction of this file, senior auditor is making notes on it and signing on it with the date of review. The next process is followed by junior audit to answer the comments of reviewer by making correction on their working paper. This process is completely done once the senior auditor approved the audit universe working paper and there will be working papers that supposed to be reviewed by Chief Audit Executive (CAE);
5. The CAE logs in to the EMS with the determined username and password;

6. They will review audit objective working papers from senior auditor. If there is any correction of this file, CAE is making notes on it and signing on it with the date of review. The next process is followed by senior auditor and junior auditor, if possible, to answer the comments of reviewer by correcting their working paper. This process is completely done once the CAE approves the audit universe working paper and there will be reviewed audit universe working papers as the sources to develop the following audit objective working papers;
7. The process is recurring to making audit objective working papers and audit resource analysis where the initial stage is coming from junior auditors who develop their files followed by the review stage from senior auditor and CAE. These three files of working paper will be crucial data to be entered into the draft of annual audit plan;
8. The junior auditor will enter data to the annual audit plan from that analysis and it will be reviewed again consecutively by the senior auditor and CAE until there is no correction amongst the internal audit team;
9. Once the draft of the annual audit planning is approved, the process is done and it can be discussed with the external parties.

Conclusion

The study proposes the to-be business process model for the internal audit function at J Corp. This new business process model is highly expected

beneficial for internal auditors to make improvements in their activity of audit planning as it has been harmonized with the standards for professional practice of internal auditing. The highlight improvements of this to-be business process are there is targeted action that should be done by auditors to prepare audit planning by developing audit working papers and there is mandatory step of review process of the auditors' working papers by senior auditor and the CAE. These additional processes in the new model will raise audit quality by ensuring that the process of audit is well documented and the audit works are assessed by peers. However, there are several challenges to practice this new model including the auditors should construct audit working papers that suitable with the nature of company's business and how the peers of audit team evaluate them effectively. These challenges could be further studied for future research on how to develop audit working papers for a company with unique business process and on how to evaluate the works of auditor in each engagement. Moreover, this business process change also has been adjusted with the need of an internal auditor that will be using a software of internal audit management as this tool will support them in the audit activity. A future action of collaboration between software developers and internal auditors at J Corp is recommended to create an information system management for internal auditing based on this to-be business process model.

Acknowledgments

This research was made possible with funding from the Research and Community Service Unit of the State Polytechnic of Malang through DIPA Research Grant Number SP DIPA-023.18.2.677606/2023. The authors are also grateful to the internal auditors at J Corp, an Indonesian state-owned enterprise for supporting data and time for discussion during this study.

References

- Adesola, S., & Baines, T. (2005). Developing and evaluating a methodology for business process improvement. *Business Process Management Journal*, 11(1), 37–46. <https://doi.org/10.1108/14637150510578719>
- Anderson, U. L., Head, M. J., Ramamoorti, S., Riddle, C., Salamasick, M., & Sobel, P. J. (2017). *Internal Auditing: Assurance and Advisory Services* (4th Edition). The Internal Audit Foundation.
- Aobdia, D., Choudhary, P., Sadka, G., Leuz, C., McNichols, M., Michas, P., Merkley, K., Schipper, K., Yohn, T., & Zingales, L. (2020). *Why Do Auditors Fail to Report Material Weaknesses in Internal Controls? Evidence from the PCAOB Data*. <https://ssrn.com/abstract=2838896>
- Ardha, N. B. D., Riwijanti, N. I., & Haris, Z. A. (2023). Fishbone diagram: Application of root cause analysis in internal audit planning. *International Journal of Financial, Accounting, and Management*, 5(3), 297–309. <https://doi.org/10.35912/ijfam.v5i3.1498>
- Birkmeier, D. Q., Klöckner, S., Overhage, S., Birkmeier, D. Q. ; Klöckner, S. ; & Empirical, A. (2010). *Association for Information Systems An Empirical Comparison of the Usability of BPMN and UML Activity Diagrams for Business Users Recommended Citation*. <http://aisel.aisnet.org/ecis2010http://aisel.aisnet.org/ecis2010/51>
- Carnaghan, C. (2006). Business process modeling approaches in the context of process level audit risk assessment: An analysis and comparison. *International Journal of Accounting Information Systems*, 7(2), 170–204. <https://doi.org/10.1016/j.accinf.2005.10.005>
- Erlina, E., Nasution, A. A., Yahya, I., & Atmanegara, A. W. (2020). THE ROLE OF RISK BASED INTERNAL AUDIT IN IMPROVING AUDIT QUALITY. *INTERNATIONAL JOURNAL OF MANAGEMENT*, 11(12). <https://doi.org/10.34218/ijm.11.12.2020.029>
- Heldifanny, R. A., & Tobing, R. P. (2018). Evaluation of Risk-Based Internal Audit Plan Implementation in the Era of Technology Disruption: Case Study at University X. *3rd Asia-Pacific Research in Social Sciences and Humanities*, 316–322.
- Manghani, K. (2011). Quality assurance: Importance of systems and standard operating procedures. *Perspectives in Clinical Research*, 2(1), 34. <https://doi.org/10.4103/2229-3485.76288>
- Michalik, P., Štofa, J., & Zolotová, I. (2013). The Use of Bpmn for Modelling The Mes Level in Information and Control Systems. *Quality Innovation Prosperity*, 17(1). <https://doi.org/10.12776/qip.v17i1.68>
- Nyarombe, F., Gideon Musau, E., Kavai, I., & Kipyegon, K. (2015). The Effect of Risk Based Audit Approach on the Implementation of Internal Control Systems: A Case of Uasin Gishu County. *International Journal of Business and Management Invention ISSN*, 4, 12–32. www.ijbmi.org
- Reza, M. (2022). RANCANG BANGUN SISTEM INFORMASI AUDIT MUTU INTERNAL UNIVERSITAS MUHAMMADIYAH MALUKU UTARA BERBASIS WEB. *Jurnal Dintek*, 15(2), 2589–8891. www.jurnal.umm.ac.id/dintek
- Samagaio, A., & Diogo, T. A. (2022). Effect of Computer Assisted Audit Tools on Corporate Sustainability. *Sustainability (Switzerland)*, 14(2). <https://doi.org/10.3390/su14020705>
- Špaček, M. (2021). Business process risk modelling in theory and practice. *Quality Innovation Prosperity*, 25(1), 55–72. <https://doi.org/10.12776/QIP.V25I1.1551>

The Institute of Internal Auditors. (2016). *INTERNATIONAL STANDARDS FOR THE PROFESSIONAL PRACTICE OF INTERNAL AUDITING (STANDARDS)*. www.globaliia.org

The Institute of Internal Auditors. (2020). *Developing a Risk-based Internal Audit Plan*. The Institute of Internal Auditors. www.theiia.orgwww.theiia.org

Weske, M. (2007). *Business Process Management*. Springer.

Wohed, P., Van Der Aalst, W. M. P., Dumas, M., Ter Hofstede, A. H. M., & Russell, N. (2006). On the Suitability of BPMN for Business Process Modelling. *Business Process Management: 4th International Conference*, 161–176. www.workflowpatterns.com