

INTERNAL AUDITORS' READINESS IN AUDIT 4.0  
PROJECT MANAGEMENT

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A project report submitted in partial fulfilment of the  
requirements for the award of the degree of  
Master of Project Management

School of Civil Engineering  
Faculty of Engineering  
Universiti Teknologi Malaysia

FEBRUARY 2021

## **DEDICATION**

I dedicate this project report to my husband and family, for their love and endless support for me throughout the process. Not forgetting to my friends and colleagues for their support and cooperation

## **ACKNOWLEDGEMENT**

In preparing this thesis, I was in contact with many people. In particular, I wish to express my sincere appreciation to my thesis supervisor, Associate Professor Dr. Siti Zaleha Abdul Rasid, for her encouragement and guidance of my Master study. Without her continued support and interest, this thesis would not have been the same as presented here.

I would like to thank my colleagues and my managers from Group Internal Audit Department, Tenaga Nasional Berhad, who have contributed to this study through their participation in questionnaire surveys and research interviews.

My fellow postgraduate student should also be recognised for their support and assistance. Their views and tips are useful indeed. Unfortunately, it is not possible to list all of them in this limited space.

Last but not the least, I would like to thank my husband for supporting me spiritually throughout writing this study and my life.

## **ABSTRACT**

This study was conducted to examine the level of readiness of the Internal Auditors in the development of Audit 4.0 in the Project Management audit. Currently, the digitalization has grown rapidly in the activities in each Project Management process. The use of automation system has been recognized for its effectiveness in ensuring that projects are completed according to the established time, within the agreed budget and according to the requirements of the contract. In addition, to ensure that projects are always managed well, project audits should be held periodically. Therefore, project auditing should consider the automation system in the project management process as part of the internal controls. In this study, the author have adapted the project management processes and internal controls practiced by Tenaga Nasional Berhad in determining the level of understanding of the Internal Auditors on Audit 4.0 Project Management. In addition, findings from the previous studies were extended in determining the level of readiness of the Internal Auditors in adapting Audit 4.0 Project Management. This study was conducted by distributing questionnaires to the Internal Auditors of Tenaga Nasional Berhad and conducted interviews with the audit management. This study concludes that the Internal Auditors understand on the application of Audit 4.0 in the project management process, especially within the scope of the Payment Process. The study has found that the Internal Auditors were prepared to adapt the Audit 4.0 Project Management and agreed that the management was always prepared to assist the auditors in dealing with these changes.

## ABSTRAK

Kajian ini dilakukan bertujuan untuk mengkaji tahap kesediaan Juruaudit Dalaman dalam perkembangan Audit 4.0 dalam audit Pengurusan Projek. Pada masa ini, digitalisasi telah berkembang pesat dalam aktiviti-aktiviti di dalam setiap proses Pengurusan Projek. Penggunaan sistem automasi telah diakui keberkesanannya dalam memastikan projek disiapkan mengikut masa yang ditetapkan, dalam bajet yang dipersetujui dan mengikut kehendak kontrak. Selain itu, dalam memastikan projek sentiasa diuruskan dengan baik, pengauditan projek perlu diadakan secara berkala. Oleh itu, pengauditan projek harus mengambil kira sistem automasi dalam proses pengurusan projek adalah sebahagian daripada kawalan dalaman. Dalam kajian ini, penulis telah mengadaptasi proses pengurusan projek dan kawalan dalaman yang diamalkan oleh Tenaga Nasional Berhad dalam menentukan tahap kefahaman Juruaudit Dalaman mengenai Audit 4.0 di dalam Pengurusan Projek. Selain itu, dapatan dari kajian sebelumnya dikembangkan untuk menentukan tahap kesediaan Juruaudit dalam menyesuaikan Audit 4.0 dalam Pengurusan Projek. Kajian ini dijalankan dengan mengagihkan borang soal selidik kepada Juruaudit Dalaman Tenaga Nasional Berhad dan menjalankan temu bual bersama pihak pengurusan audit di Tenaga Nasional Berhad. Kajian ini menyimpulkan bahawa Juruaudit Dalaman memahami mengenai penerapan Audit 4.0 dalam proses pengurusan projek terutamanya di dalam skop Proses Pembayaran. Kajian ini juga mendapati bahawa Juruaudit Dalaman bersedia dalam menyesuaikan Audit 4.0 di dalam audit Pengurusan Projek dan mengakui bahawa pihak pengurusan sentiasa bersedia untuk memberikan sokongan kepada juruaudit dalam menghadapi perubahan ini.

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## **LIST OF ABBREVIATIONS**

TNB	-	Tenaga Nasional Berhad
GIA	-	Group Internal Audit Department
SRM	-	Supplier Relationship Management
SCMS	-	Supply Chain Management System
PO	-	Purchase Order
IoT	-	Internet of Things
CIA	-	Chief Internal Auditor
RII	-	Relative Importance Index
ANOVA	-	Analysis of Variance

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Project Management involves various processes starting from initiating, preparing, implementing, managing, and concluding a team's work to accomplish specific objectives and fulfil specific performance requirements at a given time. Therefore, projects need to be well-managed and controlled to provide organizations a great opportunity to create value. Projects implemented in accordance with time, cost and quality limits are well-managed projects. To help the project achieve the set progress, an efficient audit process needs to be implemented in each project activity. A project audit is an assessment of the project, often intended to determine the standard to which principles of project management are being followed (Ruskin & Estes, 1984). In order to maintain the highest productivity, automated project management has become highly necessary and, as a result, huge data will be analysed by the project teams to enable business process adaptations to satisfy product and service demand (Thee & Saing , 2018). Therefore, big data can be used by auditors to conduct predictive and prescriptive analytics to assess the probability of future performance.

According to Lahmann, et al. (2018), traditional project management styles have to be changed in order to adaptable with the Industry 4.0 with many variations (Lahmann, Keiser, & Stierli, 2018). As the shift of traditional project management towards a revolution of technology in the business process in Tenaga Nasional Berhad (TNB) today, the auditing profession also finds itself responding to multi-faceted changes in the auditing process. Dai & Vasarhelyi (2016) discussed the skills of auditors need to change intensely with the adaption of automation process scrutiny.



The study concluded that the auditing profession should respond to these developments and exploit new technologies to extend the audit context, shorten timing, reduce errors, and improve the standard of assurance. This chapter will discuss the background of the study on the development of technology in the audit process and implementation of Audit 4.0 in the Project Management audit. The aim of the study is to determine the level of Internal Auditors' readiness for the implementation of Audit 4.0 that will change the nature of the audit approach.

## **1.2 Background of Study**

Project management will be strongly influenced by new technology, and there is no question that artificial intelligence will transform the way it is possible to execute and monitor project management tasks. Professionals believe Artificial Intelligence (AI) will develop from fundamental process management to constructive project review, suggestion and implementation (Wang, 2019). The inarguable function of technology has enhanced working conditions and efficiency on the construction site, and its importance is beyond debate (Nagy, Oláh, Erdei, Máté, & Popp, 2018).

Tenaga Nasional Berhad (TNB) is the largest electricity utility company in Malaysia. With their core business of providing electricity to the country's businesses, homes and industries, they also not being left behind in implementation of Industry 4.0. E-Procurement or also known as Supply Chain Management System (SCMS) has been implemented at TNB since 2014 for all projects. The objectives of implementation of SCMS in TNB are to derive more price / values and better procurement control in all projects and maintenance works. Availability of SCMS such as E-Tender, E-Bidding, contract collaboration, e-PO, supplier relationship and spend performance analysis will enhance efficiency and productivity of projects. There are 5 modules consist in SCMS are E-Procurement, Supplier Relationship Management, Supplier Buyer Portal, E-Contract Management and Spend Analysis.

Table 1.1 Modules in Supply Chain Management System (SCMS) of TNB

Modules	Functions
E-Procurement	<ul style="list-style-type: none"> <li>• Tendering process</li> <li>• Creating purchase order (PO)</li> <li>• PO status</li> </ul>
Supplier Relationship Management	<ul style="list-style-type: none"> <li>• Registration of suppliers</li> <li>• Renew registration of suppliers</li> <li>• Tender info</li> <li>• Supplier portal</li> <li>• Master Data Management of suppliers</li> </ul>
Supplier Buyer Portal	<ul style="list-style-type: none"> <li>• Shopping cart (buying tender)</li> <li>• Auction</li> <li>• Tender report</li> </ul>
E-Contract Management	<ul style="list-style-type: none"> <li>• Documentation (Letter of Intent, Letter of Award, Variation Order, Master Agreement, Contract Documentation)</li> <li>• Enforcement (Performance Security, Assignment of Deed of Agreement (ADOA), Liquidity Ascertain Damages, Contract Termination, Dispute, Closure)</li> </ul>
Spend Analysis	<ul style="list-style-type: none"> <li>• Spend performance analysis</li> </ul>

SCMS was integrated from project initiation phase until closing phase as shown in Figure 1.1. One of module in SCMS is Supplier Relationship Management (SRM), which give benefits for both TNB and suppliers.

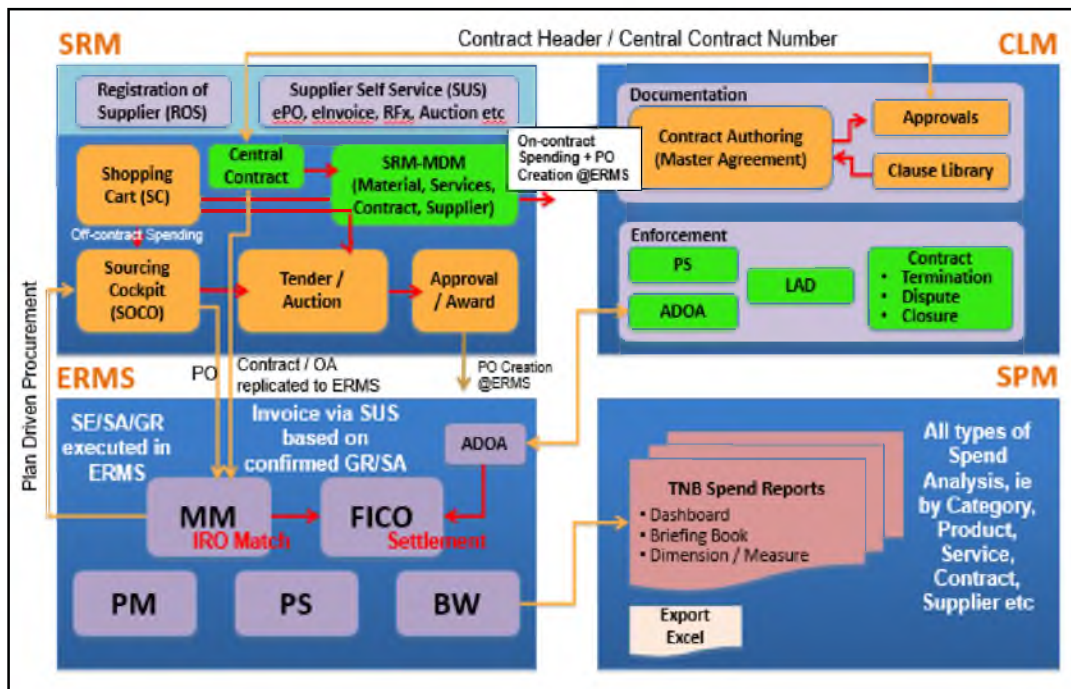


Figure 1.1 Integration Modules in SCMS (Source: TNB Internal Policies)

One of the modules in SCMS is Supplier Relationship Management (SRM), which provides benefits for both TNB and suppliers. Suppliers will be able to access the E-PO, review the status of the contract, the invoice status, the status of the payment and the new tender. They are also able to digitally post invoices and receive PO acknowledgment if there are any PO changes. Meanwhile, the benefits of SRM to TNB are reduced costs in the procurement cycle, accelerated speed and accuracy of information exchange to suppliers and enabled supplier segmentation and development, i.e. diversity and risk management and performance management of suppliers.

Additionally, as reported in TNB Integrated Annual Report 2019, one of the nine key areas in the 5 Years Distribution Grid Framework (2020-2025) is the digitalisation of current work processes and culture. Therefore, it will influence the audit processes and procedures to be carried out, especially for project management.

In order to ensure that the project complies with all applicable governance regulations, an audit of the project management should be performed. A project management audit is a review intended to assess the true status of the work performed on a project and its conformity with the project plan of progress, including schedule and budget constraints. It is an independent, formal review of the state of things which conducted by a skilled auditor (Ruskin & Estes, 1984). Since Industry 4.0 is a comparatively new way of managing activities, there could be forms of risks. In certain situations, Industry 4.0 implementation has demonstrated that interactions between people, processes, and resources have become a network that is more complex, flexible, and configured in real time (Tupa, Simota, & Steiner, 2017). Thus, a project audit be able to provides an opportunity to discover the issues, problems and difficulties faced during project implementation, that can assist the project manager, project owner and project team an overall perspective on what's been going on and what needs to be done in the project in order to achieve this successfully (Nalewaik & Mills, 2014).

From the previous research stated that as industry moves toward the next generation, auditing should also adapt to the new environment (Dai & Vasarhelyi, 2016). Auditors can leverage new technologies to collect a large range of real-time, audit-related data, automate repetitive processes involving few or simple judgments, and eventually achieve comprehensive, timely, and accurate assurance (Dai & Vasarhelyi, 2016). A recent study of the transformation Industry 4.0 to audit landscape and business model quoted in study by Alao & Gbolagade (2019), stated that technology has the opportunity to enhance and add value to the standard of audits. The audit processes are moving from continuous control monitoring (CCM) to continuous transaction monitoring (CTM), which happens real-time at the auditee's place (Alao & Gbolagade, 2019).

### **1.3 Problem Statement**

As Audit 4.0 is discussed in general, it is clear that a transition has arisen from manual auditing to digital auditing. It utilizes an automation system and data exchange intensively. Auditing has had a manual and human-focused system in the past (Ozturk, 2019). Instead of conventional audits, technology-driven audits are now being conducted, and so immediate assurance can be obtained as a result of audits. In order to audit automated production processes and company activities, manual monitoring processes have been shown to be insufficient. Many of the audit processes at present have not been carried out independently and have simply depends on management information (Byrnes P. E., et al., 2018).

Manual control systems have been found to be inadequate to inspect automated production processes and business operations (Ozturk, 2019). An audit engagement between the auditor and the auditor is usually carried out following the pre-audit process, with risk assessment and definition of the audit's nature and objectives. Auditors may collect and analyse audit information and establish internal control decisions during audit fieldwork. Finally, the auditors will release a thorough report showing the related findings. (Byrnes P. E., et al., 2018). This method requires significantly extra costs and substantial delays in times associated with data collection, audit fieldwork and reporting.

Developments of the revolution of Artificial Intelligence (AI), big data analytics and block-chain technology have a significant effect on auditing. Technology is changing the way business is conducted and data is analysed. It enables auditors to collect and analyse the large set of data that were previously unreachable. The auditors will use AI methodologies to analyse total transaction populations in a much shorter time. But application of big data analytics for auditing purposes could be to enrich insights about non-accounting information, derived from big data (Tiberius & Hirth, 2019). Some current audit procedures can be automated, such as auditing in procurement for projects using E-Procurement, which requires auditors to evaluate the process from various sources and skills. Across an environment of increased complexity and process review, auditors ' capabilities are likely to evolve significantly.

Based on the statement of former President of the Malaysian Institute of Accountants (MIA), Salihin Abang stated that approximately 70 per cent audit firms in sole proprietorship concentrate in audit work but low in technology adoption. The auditor must be much more technically competent, but the system must be constructed with the consideration of unskilled users (Dai & Vasarhelyi, 2016).

Previously, there was a research study which discovered the effects and usage of the technologies that encompass Industry 4.0 upon the audit process (Alao & Gbolagade, 2019). The result of the study found that Industry 4.0 improves audit effectiveness through the integration of new types of evidence, such as Auditor Implications (AI). The auditors will use AI methodologies to analyse total transaction populations in a much shorter period (Alao & Gbolagade, 2019). However, the study found that auditors may face challenges with the advancement of Industry 4.0 technology such as cyber security, since technology's ability can be used to steal large quantities of data without noticeable traces (Dai & Vasarhelyi, 2016). Additionally, Alao & Gbolagade (2019) found in their study that auditors need to adapt to the changes in business models. They also found out the auditors also must possess extensive technical and analytical skills that are currently not components of most traditional auditing. These gaps shows that development of Industry 4.0 in auditing works, but the competency of auditor is questionable.

Current practice of audit approach at the Group Internal Audit Department (GIA), Tenaga Nasional Berhad is to use a substantive approach. The substantive approach is referred to as the vouching approach or the direct verification approach. The aim of this approach is to analyse large volume of data and financial information without a strong emphasis on specific areas of financial reports (Chan & Vasarhelyi, 2011). According to Chan & Vasarhelyi (2011), manual internal monitoring and substantive checking are regularly conducted in a traditional audit to assess the claims of management. As new technologies are used in the project management process, auditors are less likely to be able to use substantive checks (Alao & Gbolagade, 2019). Technology is changing the way business is conducted and data is analysed (ICAEW, 2017). According to Alao & Gbolagade (2019), the advanced technology influences the audit profession and the applications that need to be audited (Alao & Gbolagade,

2019). The study concludes that automation of robotic processes has the potential to increase audit performance and add value to Industry 4.0's impact on the audit profession. Industry 4.0 will introduce a new audit methodology that Internal Auditors need to practice (Alao & Gbolagade, 2019).

Therefore, the auditors need to adapt to the changes in business models. The auditors also must possess extensive technical and analytical skills that are currently not components of most traditional auditing. In this scenario, the audit needs to change its approach for auditing automated processes. However, the question is, how does the audit approach have to change for auditing automated processes? Are the employees ready and have the right skills to execute the audit process?

#### **1.4 Research Questions**

From the main issue of implementation of Audit 4.0 in the Project Management audit will impact to audit process and audit approach, three research questions have been generated about the readiness of the Internal Auditors for the impact of Audit 4.0 as follows:

- (a) What is the level of understanding of Internal Auditors on Audit 4.0 in the Project Management audit?
- (b) What is the level of readiness of Internal Auditors on Audit 4.0 in the Project Management audit?
- (c) How to improve the knowledge and skills required on Audit 4.0 in the Project Management audit?

## **1.5 Research Objectives**

The aim of the study is to determine the level of Internal Auditors' readiness for the implementation of Audit 4.0 that will change the nature of the audit process and audit approach. To achieve this aim, the three main objectives of this study are as follows:

- (a) To determine the level of understanding of Internal Auditors on Audit 4.0 in the Project Management audit.
- (b) To determine the readiness of Internal Auditors on Audit 4.0 in the Project Management audit.
- (c) To propose suggestions on how to improve knowledge and skills required on Audit 4.0 in the Project Management audit.

### **1.5.1 Hypotheses**

This study has four hypotheses to determine if there are any significant differences in the level of understanding of Audit 4.0 in the Project Management audit and the level of readiness of the Internal Auditors on Audit 4.0 between position and years of experience. The hypotheses are as follows:

- (a) H1: There is no significant difference in the level of understanding on Audit 4.0 between positions.
- (b) H2: There is no significant difference in the level of understanding on Audit 4.0 between years of experience.
- (c) H3: There is no significant difference in the level of readiness of the Internal Auditors on Audit 4.0 between positions.
- (d) H4: There is no significant difference in the level of readiness of the Internal Auditors on Audit 4.0 between years of experience.



## **1.6 Research Scope**

The focus of this study is to evaluate the level of readiness of Internal Auditors in Group Internal Audit Department, Tenaga Nasional Berhad on Audit 4.0 in the Project Management audit. The area in Project Management will be reviewed, which includes the process from the Procurement Process, Project Implementation, Payment Process and Project Closing. Quantitative study by distribution of questionnaires were selected as data collection method to help obtain data. In addition, qualitative research methods have been developed in the initiative provided by employers to promote digital skills among Internal Auditors. Interviews were conducted with Chief Internal Auditor and the relevant General Manager and Senior Manager.

## **1.7 Significant of Research**

Although this study is exploratory in nature, it is expected that the findings presented in this study will make meaningful contributions both theoretically and practically. Theoretically, it is expected that this study will contribute understanding on the Audit 4.0 in the Project Management audit. Furthermore, this study is intended to provide new perspectives into the readiness of Internal Auditors for the introduction of Audit 4.0. Practically the findings of this study can benefit organizations in identifying areas that need improvement by enhancing digital skills among Internal Auditors. In addition, this study will enhance the previous study on the evolution of auditing method, from the traditional approach to the future audit.

## **1.8 Definition of Key Terms**

AUDIT 4.0 – Technology supported by Industry 4.0 for collecting financial and non-financial information and analysing, processing and presenting information in order to provide an accurate, efficient and real-time assurance.

AUDIT - An evaluation to assess the status of the work done on a project and its compliance, including schedule and cost constraints, with the project requirements. It is an independent and formal assessment conducted by the auditors.

The process consists of info gathering, audit fieldwork, audit report and follow-up analysis, or often referred to as corrective action. At each point of the audit process, the participation of auditors is important.

AUDIT PROCEDURE - Auditors are designing audit procedures to identify all risks they have found and to ensure that the appropriate audit information is collected correctly and fairly. If audit priorities, audit scope, audit approach and audit risks have been defined, the auditor may normally, at the preparation level, prepare an audit procedure.

AUDIT APPROACH - The technique used by an auditor to perform an audit is an audit approach. The procedures, strategies, and methods conducted by auditors to obtain audit evidence that allows them to conclude and express their judgment on the purpose of the set audit.

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